VOL. XVIII. NO. 10 MAY 15, 1890.

GLEANINGS IN BEE CULTURE

DEVOTED TO BEES AND HONEY

& HOME INTERESTS.

MEDINA, OHIO.

BY

A. I. ROOT

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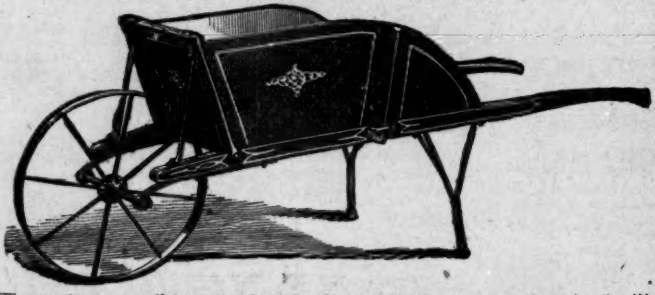
OUR DAISY WHEELBARROW.



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A. I. ROOT, Medina, Ohio.

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FROM THE LAND OF THE PHARAOHS.

THE PYRAMIDS AND THE SPHINX.

Continued from last issue.

WE were drawing near to the largest monuments existing. Although we read and see illustrations of the Pyramids, still it was bewildering, that first sight of those mighty and imposing Pyramids of Gizeh. We visited the greatest of them, built by King Khufu (Cheops of the Greeks), of the 4th Dynasty. It is said that this king employed 100,000 workmen, building daily during the space of 30 years, and it cost 1000 talents of silver, or $1,877,000. It is now 141⅕ meters high, or about 463 feet. We crawled up and down the high and narrow passages in the interior, conducted by the Bedouins, who are constantly lurking about the place on purpose to guide the visitors. It would be a very difficult task to do without them. The room in which the mummy was laid is covered by great blocks of granite, from 30 to 40 feet long, and 5 to 6 feet square, lying horizontally on top. We visited the great Sphinx of Harmakhas, 22 meters high and 30 in length. The face is somewhat ruined, owing to the fact that the Mamelukes tried their cannon-balls at it. Close beside is the ruined temple of the Sphinx, built of alabaster and granite.

THE WINDING BRIDGE AND THE ELEVATED ROADS IN THE VICINITY OF THE NILE.

We were driving on a long, winding, and elevated road, and landed at a village all surrounded by mud and palm-trees. During the months of the submersion of the Nile, all the *fellahin* (the farmers of Egypt) go to Cairo by boats, as being the cheapest way; and in winter and spring they follow the winding bridge-roads, as they call them. An apiary of about 60 hives, laid horizontally above each other in rows of 10, was the first we saw. They were far more regularly built than the ones at Alexandria. The female inhabitants only were present, and readily told us every thing they knew about bees and bee-keeping—more freely than our Palestine fellahin would. They showed me their implements, much like those of Palestine. They directed me to another village, a few miles away, where I might better satisfy my curiosity.

A MOHAMMEDAN BEE-KEEPER.

We soon were on the main winding-bridge road again. After two hours' donkey-back drive we came to Menshiet-el-Bakari, surrounded by a broad ditch of water; but beyond this were endless fields of (white?) clover. They told me it had white blossoms. I knocked at the door of the designated bee-keeper, an old man, a stout Egyptian, 55 years of age, in a long gown of shirting, barefooted, and a small white cap covering the crown of his sheared head. He came forth, shook hands with me, and began:

"Peace be unto you." My answer, "And to you be peace," was followed by introducing myself to him as an inquisitive bee-keeper coming from the Holy Land, or Land of Damascus, whereupon he bade me welcome. A mat was spread on the floor in front of the most imposing apiary I had ever seen of the kind. We squatted down. I explained to him the intention of my visit, and away we went, chatting, as if we had been old friends. The Hugh Mustapha seemed very communicative; and having handed me a tiny cup of coffee and drank one himself, the usual compliments were exchanged.

"Please God it may always be so" (the presenting of coffee). He replied, "Please God it may be double health to you." He began:

"By the life of the most mighty God and the prayer of Mohammed, I 'm going to tell you every item, and all the truth," and bade me write down

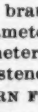
every word, "so that, when you'll be back to the land of Damascus you may apply this most rational bee-keeping amongst the ignorant people there."

The front view showed the most beautiful, regular, and well-kept apiary I ever beheld in all Syria, Palestine, or Egypt. The apiary consisted of 600 hives, lying in 6 rows of 100, horizontally above each other.

About the middle of January the bee-master opens all the hives from the back side, and, with a lighted smoker in hand, throwing gentle puffs of smoke into each hive, listens for the wooing of the queen. He then, if any queen-cells are visible, cuts them off the edges of the comb. He does this in view of the swarms. By this method he seldom has more than one swarm per hive, for he dreads a multiplicity of swarms—a great nuisance to the parent hive, besides being themselves very weak. He says he has only the trouble of swarming them, and finally of finding them destroyed by the wax-moth or hornets. When this business of cutting cells is all done, the hives are again stopped from front and rear. About two months after, he again visits the hives to take the honey, which he expects to find full as long as the clover-fields are in blossom, and the bees visiting them eagerly.

In places where cotton grows, two honey-harvests can be had, and he gets an average of 8 lbs. per hive. The clover remains in blossom during four months, or till about the middle of May, at which time the drone massacre begins, as the bees don't like them crawling over the nice honey-combs, soiling them.

He leaves in every hive five combs of brood and honey, so that they have a good start to refill their hives. New swarms are treated the same. He takes off the old hives five combs, with brood and honey, and sets them in the hive. To take the swarm, the combs are fixed in the new hive by means of sticks, 8 inches long, and having a branch in the center, of about an inch in length.



On this branch A B the comb is hung. The inside diameter of the hive being just 8 inches in diameter, this kind of movable system is easily fastened in.

A MODERN FLOATING APIARY ON THE NILE.

In years gone by, when he was able to undergo more hardships, as soon as the honey-flow in his place was over he used to take the hives, stopping the entrances, load every sixteen hives on a camel, and take them (by night) to the Nile, some 3½ hours' walk, where they were put on a boat, and taken up or down the river to a place where plenty of honey-producing flowers were still in bloom. The boat is anchored at its destination, and marked. As soon as the honey-flow begins it is indicated by the sinking of the boat. As soon as the mark has gone one meter below the surface, he knows the hives to be full; and after cutting out the honey he examines the boat anew. If this ingenious balance indicates a continuation, he remains in the place; but if, on the contrary, such a place is looked for as having flowers, or if none are to be found, the product is sold in Cairo on the return trip.

AN EGYPTIAN BEE-SMOKER.

The smokers are only bovine cakes, made from half-eating-cattle manure, as all other manure from broad beans and clover is a nuisance to the bees, and communicates a bad smell to the honey. Each smoker is 8 inches long, and is lighted at the top, and is to be kept by blowing continually. I told him of the improved Bingham and Clark smokers; but to all my observations he would not listen, he having arrived at a degree of knowledge not to be surpassed by anybody else, and as being the owner of 1100 hives in three apiaries, the most considerable of which was the one before which we were joyfully talking and listening by turns about the blessings of apiculture. It consisted of 600 hives, as above-mentioned. He had 200 or 300 hives in his out-apiaries, and, besides, took charge of all the apiaries in the vicinity, sharing all the income (swarms included) on halves. He told me there is none to equal him in knowledge; and all bee-keepers from far and wide have acknowledged his superiority, the same coming to ask him questions. He went on describing his ways and manner, and as it was now half-past eleven, and being Friday, the *muezzin* (the caller for prayers) reminded them of their duties. PH. S. BALDENSPERGER.

Jaffa, March 5, 1890.

Friend B., we congratulate you on the happy way in which you have recounted to us your exceedingly interesting account of your visit to one of the bee-keepers of Egypt. I am surprised that you say nothing about the vindictiveness of the Egyptian bee. Those brought to our country some years ago were so terrible to sting that the whole race was soon stamped out of existence. And so it is indeed true, that there is a man living who has formerly made it his business to run a floating apiary on the Nile. Why, our good friend Perrine should make a visit to Egypt on purpose to learn how, and then come back and revive his steamboat apiary. It seems to me that those camels must have been exceedingly docile to submit to carrying 16 hives of bees. I wonder if they have as much trouble in moving bees with camels as we do with horses and wagons, supposing the bees chance to get out of their hive. And, again, these clay or crockery hives, one would think, would be rather fragile for a camel's back, or for loading on to boats. Never mind, even if our friend would *not* listen to any thing you had to tell him about Clark and Bingham smokers. With his 1100 hives, his out-apiaries, his floating bee-palaces, and camels, he certainly is entitled to considerable respect. Who knows but that he may visit us some time in the future? What a grand thing it would be to have such a chap to attend a bee-keepers' convention! The very self-conceit that he has so strongly emphasized is one of the results of staying at home. Now, may be this last remark strikes a clip at some of you. Well, I do not care very much if it does. Staying at home, when carried to excess, dwarfs and impoverishes both body and mind.

FEEDING BEES, ETC.

SOME QUESTIONS ANSWERED BY DOOLITTLE.

A CORRESPONDENT wishes me to answer, through GLEANINGS, the following questions: "What is the best method of feeding bees, and when and what shall I feed to stimulate brood-rearing?" I suppose that, of course, our correspondent knows that stimulative feeding is for the purpose of arousing the bees to greater activity, and for greater result

in brood-rearing; hence when daily feeding is resorted to, but little should be fed to each colony, which, as a rule, should be given just at night, or near sundown, so as to prevent robbing and demoralization. There are different ways of giving this feed, such as feeders of various kinds kept by all dealers in supplies; by tipping the hive up a little in front when a tight bottom-board is used, and pouring the feed in at the entrance, or in at the top over the bees, and by filling the combs with feed, and setting one such comb in the hive every few days. When plenty of empty combs are at hand, I prefer the latter plan, and do not know but that it stimulates the bees to as great extent as by any other way; the reason why I prefer it, being that it is much less work. To fill the combs with the feed, lay one flat down in a wash-tub, wash-boiler, or something of the kind having deep sides, so as to prevent the feed spattering about the room, when with a quart dipper, whose bottom has previously been punched full of small holes (punching from the inside out), the feed is dipped and held up about a foot over the comb, so as to fall in fine streams into the cells, thus driving out the air, and filling each cell full. Now turn the comb over, and fill the other side, when it is to be hung up to drain a little while, after which it is ready to be placed in the hive the same as a frame of honey. If a person has but few colonies, and likes to work at them, daily stimulative feeding is only a pleasure; but with hundreds of colonies it is very laborious, and is considered by many to be only a waste of time, especially when the colony has plenty of honey in the hive. The feed to be used at this time of year is made by dissolving two pounds of granulated sugar in one pound of boiling water, and it is ready to feed as soon as it is cool enough not to burn the bees.

TWO QUEENS WITH A SWARM.

Next he asks: "Do bees ever have two queens? Last summer I hived a swarm that had two queens, and my neighbor tells me that there were two swarms." The first, or prime swarm, never has more than one queen with it unless the old queen has been killed by some accident, for the old queen always goes with this swarm, leaving maturing queen-cells in the old hive, from which, when hatched, the young queens lead out all after-swarms. The only exception to this is where the old queen is lost, as hinted at above, near the swarming season, when several queen-cells will be formed so that young queens may lead out what appears to be the prime swarm, the same as they do after-swarms; but such swarms can hardly be called prime swarms. About eight days after the first swarm has issued, the first young queen will be hatched, as a rule; but if after-swarming is considered best in the economy of the hive, the young queens are kept in their cells, and fed through an aperture in the royal cell, by a little knot of bees, say a dozen or two. If swarming is not considered "economy by the bees," then all the other queen-cells are torn down and the young queens destroyed, so that the first hatched is the only queen in the hive. If the cells are protected as above, the first-hatched queen seems to get in a rage and utter shrill notes at intervals, called "piping," which our questioner has doubtless heard. This is kept up for two or more days, when the second swarm, or first of the after-swarms, issues. The queens kept back in the cells are growing in age the same as the one which is out, and so it often happens that, during the hurry and bustle of swarming, the knots of bees leave the queen-cells, when these young queens hastily finish biting the covers off their cells, and go out with the swarm, in which case there are two or more queens with a swarm, so that you were probably right and your neighbor wrong.

WHICH WAY SHOULD HIVES FACE?

He next asks: "Should a hive face north or south?" All bee-keepers agree, I believe, that hives should never face north of an east-and-west line, and the majority favor a south-easterly direction—at least, that is *my* preference. The reason for this is, that the sun entices the bees out to work earlier in the day, while a northern exposure keeps them in later; and in winter, where wintered on the summer stands, it is almost sure to result in the loss of the colony, from our rigorous north winds blowing in at the entrance, and the confinement of the bees, caused by the entrance being in the shade on mild sunshiny days. The only colonies I ever tried to winter facing the north died before spring.

SHADE FOR HIVES.

The last question asked is, "Is it best to have a roof over the hives, or have them under a shade-tree for shade?" Some of our best bee-keepers use a shade-board made of lath, or light lumber, to shade the hives during the summer months; but if the locality is at all windy, a weight of some kind must be used on them to keep the wind from blowing them away. Years ago I used a 15 or 20 pound stone to keep these shade-boards on, and considered them necessary at that time; but as it had to be lifted every time the hive was manipulated, it soon became so laborious that I could not follow it. Shade-trees (not very dense) are always good; but after all kinds of shade have been tried by myself, I now prefer to paint the hives white and let them stand in the sun. G. M. DOOLITTLE.

Borodino, N. Y., May 3.

Friend D., I should hardly agree with you in regard to the danger in having hives face to the north. In arranging our hives in the hexagonal apiary, a great number of them faced northward; but we have not noticed any particular difference, unless it was during the cold and chilly winds in the spring of the year. I believe I pretty nearly agree with you in regard to painting a hive white, and leaving it in the sun.

EXTRACTORS FOR CALIFORNIA.

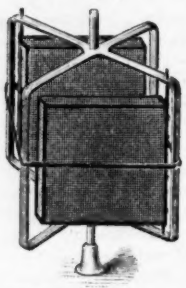
J. F. M'INTYRE DECLARES IN FAVOR OF THE REVERSIBLE PRINCIPLE.

Friend Root:—I take it for granted that you feel the same with regard to extractors that you do with regard to Italian bees and other races. You say you could sell one race as well as another, and want to know the truth. I do not know the state of bee-keeping in the east, but in this county it is almost entirely in the hands of specialists. If you will turn to page 734, 1889, you will see all the bee-keepers in this county, with the number of bees each has. A few years ago there were three times as many bee-keepers, and several of the smaller ones on the list have sold out since that report was made. I have bought Jepson out, just below me on the list. You see he had 75 colonies and a Novice

extractor. I have every thing now except the extractor, which is still lying on the ground where his apiary was. Now, I do not mean to insinuate that the Novice extractor was the cause of his failure. I only want to show you where the small bee-keeper and the small extractor are going.

A TWO-COMB REVERSIBLE GEAR.

It saves time and combs to have a reversible extractor, and it saves time and temper to have all the baskets reverse at once, without hitting each other. I have such a high opinion of the reversible baskets that I would use them, even in a two-comb extractor. I would have the axle attached to the frame above and below, but not run clear through, and place the baskets so close together that they would just pass each other by turning one at a time, like this.



M'INTYRE'S TWO-COMB REVERSIBLE EXTRACTOR.

I think the above extractor would be a good one for a man to take with him to extract a small out-apiary, and bring it home in the evening; but we don't do that way in California. All our out-apiaries are large, and we have a complete outfit at each apiary, and a man to take charge of each one for the season. Sometimes he must have an assistant; and it would never do to give them a poor extractor, or one that would break down; they might get lazy, and lay the blame on the extractor.

Although much thought has been spent on some arrangement to turn all the baskets at once, the basket itself is the greatest invention, and I should like to know very much who invented it, for I owe him a debt of gratitude.

The reversing principle illustrated on page 841 has several advantages over the Stanley. It is easier to put the combs in and take them out; the baskets never hit each other, and you don't need any experience to reverse it. If you don't want to reverse it with the crank, you can key the frame fast to the axle, and leave the cog-wheel in the center loose, when, by turning one basket, all will turn.

I have no use for a brake. I uncap two combs while the extractor is stopping. If you ever make a four-comb reversible, try the one on page 841; and if the workmanship is as good as the principle, I know you will be pleased with it. Any one is welcome to make and advertise them; and if some one doesn't, I shall say it was for lack of a patent.

Baker & Barnard, Ventura, Cal., made several; but they had no facilities for making them, and the workmanship was poor. They made enough, however, to show that the principle was all right.

Fillmore, Cal., Mar. 31. J. F. MCINTYRE.

Friend M., Ernest had an engraving made of the inside of a two-comb reversible extractor before I knew any thing about it, and he did it without knowing that we once made extractors on this very principle — namely, without any center-shaft. I think they were abandoned because they cost quite a little more, and at that time most of the people were ordering and using a cheaper extractor. It would be hard to say who invented the comb-basket. I think our German brother Mehring used wire cloth for supporting combs first in extractors; and as soon as reversing the combs inside of the extracting-can came up, there was no other way but to make a *basket* to hold the comb, with wire cloth on each side. The idea illustrated above *i. e.*, of omitting the center-shaft, is very old. It was described if not illustrated as much as 15 years ago. To be sure, friend M., we want the best extractor in the world, no matter where it comes from; but I think it very likely true that large apiaries, such as you have in California, necessitate larger machines for extracting than are ordinarily used in moderate-sized apiaries about here.

BROODING STICKS OR AIR.

DR. MILLER CONSIDERS THE MATTER.

I AM glad, friend Root, that you and Ernest don't always agree. It sometimes gives us a chance to see both sides more fairly. I hope you will always let your disagreements, more or less, come out in print. I'm "ferninst" you in the triangular controversy on page 277. Don't you think you're a little unfair in your illustration—just a wee bit, you know? You are calling the top-bars "right in the center of the brood-nest," and they are not in the brood-nest at all. True, the bees in harvest time must keep every thing warm to the top of the supers; but at that time it doesn't cost much. Even if it should cost something to keep the extra lumber warm, what does that lumber take the place of? You know well enough, that, with nearly all of us, it is a choice between slat honey-boards and thick top-bars that is now under consideration. Now, which is easier to keep warm—a piece of wood or a piece of air of the same size? In either case there is the same distance between the brood-combs and the sections—the same space to keep warm—but the wood is easier kept warm than the air, for the air is such slippery stuff that, just as the bees get it warmed up, away it slides, and a fresh piece of wind must be warmed by the bees. So, you see, if brooding "sticks" is bad, brooding wind is worse; and please tell us what you would have in place of the thick top-bar.

But I think Ernest is astray in his claim that "thick top-bars cause the combs to be built clear to the bottom-bar." I can't find the correspondence to which he refers; but were not the combs in question raised over other combs? I can hardly imagine how the bottom-bar can be affected by a top-bar several inches above it.

REVERSIBLE BOTTOM-BOARDS.

If combs will be built down to bottom-bars by means of extra space beneath, and if that extra space can be maintained without detriment all the year round, we shall owe friend Murray a vote of thanks. That will allow me to discard my reversible bottom-board, at the same time retaining all its advantages. I may say to friend Green, that, although his objections are not great compared with what I *think* are the advantages, yet I am not as well pleased as I expected to be with the reversible bottom board. The reversing is too troublesome. If, however, I can't have the deep space in summer, I shall continue to reverse.

CLEATS FOR HIVES.

I'm glad to see H. R. Boardman have the hardihood to say a word in favor of them. If I adopt Dovetailed hives, *my* Dovetailed hives will have cleats at front and back, I think.

HANDLING HIVES WITHOUT BOTTOM-BOARDS.

By reading Bro. Boardman's excellent article on page 280 I see the reason why he can handle them and I can't. He has deeper frames (I know that by reading the picture), and he waits till colder weather. As I don't want deeper hives, and don't want to wait till cold weather drives my bees off the bottom-boards, I think I shall never again leave them to be lifted off the board at time of carrying in. Indeed, I doubt whether I shall ever again carry a hive into the cellar without having the bottom fast.

COMB-BUILDING WITH CAGED QUEENS.

On page 284, friend Root, you ask whether I have noticed "changing from worker to drone comb after caging the queen." No, I don't think I ever noticed any difference. But then, how could I? The only comb they build is in the supers, the brood-frames being full, and every section is filled full of worker foundation. Yet it is quite possible that bees do not build comb so freely without a queen. I do not know whether there is any difference between caging the queen and taking her entirely away. The bees will nearly always build queen-cells with a caged queen, just as much as if no queen were in the hive; and I doubt whether better queens can be started in any other way. You see, the bees don't get frantic about being queenless, but gradually conclude that the queen lays so poorly that she must be superseded.

Marengo, Ill., April 19. C. C. MILLER.

Very likely you are nearly right, doctor, in regard to brooding sticks, but I should prefer to have as few sticks, or as little air either, between the brood-nest and the sections as we can get along with. I am inclined to think that friend Murray is right about having more space under the combs. I do not think it would be found objectionable, either winter or summer. Will those who have tried it please give us their experience?—Now, look here, old friend, if you insist on having cleats on the back and front of your hives to handle them by, you can not get them so closely together. Why don't the hand-holes answer every purpose as well as the cleat? Is it not because you have always used the cleats, and have got used to them?—In regard to comb-building with caged queens, while it may be true that they will not build comb as well, is it not also probably true that they do not gather honey with the same energy? Where the queen is taken entirely away, I can hardly believe that honey-storing will go on with the same rapidity.

FRANCE'S SHOT-TOWER BEE-HIVE.

FULL PARTICULARS OF HOW TO MAKE, ETC.

As I have so many letters asking for dimensions to make my shot-tower bee-hives, I will try, with the aid of some pictures, to give directions so anybody can make them. But first let me say this hive is to be worked for extracted honey only, and to be wintered outdoors on the summer stand, with very little or no increase. The hive when complete will hold four very large colonies of bees.

Each division will be 13½×13½ inches inside, and 3 feet 6½ inches high above the bottom-board; will hold two sets of 9 frames, one set above the other, as shown in Fig. 1. Make the bottom 32 inches square. That will give room for a 2-inch lining all round, and one inch for partitions.

You can see by the figures how the hive is made. All the lumber not wide enough to make any part of the hive must be tongued and grooved together. One partition should be 32 inches wide, and 3 feet 6½ inches high. Nail this across the bottom, in the center; match the partition lumber. We now want two narrow partitions to put the other way. Be sure to set the partitions up square with the bottom, and break joints with the narrow and wide partitions. When the partitions are in, make the stationary sides. They will be 16 inches wide, and long enough to reach from the bottom of the bottom-board to the top of the partition. Nail this on to the left-hand corner as seen in the cut, to the end of the partition and to the bottom of the hive, and leave half of the ends of the partition uncovered to form a rabbet for the movable sides to rest in. The sides will be better if made with two boards matched than it would be made from one piece 16 inches wide.

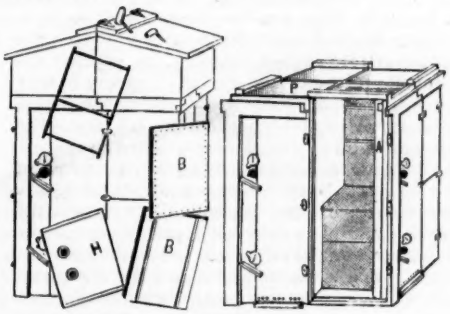


Fig. 2. Fig. 1.

FRANCE'S SHOT-TOWER HIVE.

In Fig. 2 you see the cover is held up by a cleat 2 inches wide around the hive, half of which is fastened to the stationary side, the other half to the movable sides, and half an inch below the top of the siding. This holds the side-pieces together when the side contains more than one board. There is a four-inch strip up and down the left corner. That is put on to form a rabbet for the other side of the movable sides, and should project beyond the side just the thickness of the lumber of the door or movable side.

In Fig. 1, entrances are shown. Those bottom holes explain themselves. The other two holes are 1¼ inches, with a half-inch hole at the left of the large hole. Those two large holes are covered with a button in winter, leaving the small one open, as shown in the lower one. In the summer we leave the entire hole open, as shown by the upper one. There is a little alighting-board just below the out-entrances. It is better to make those entrance-holes and put on the upper cleat before the side is nailed on. After the stationary sides are on we put a two-inch lining on the inside of the stationary sides. You see the edge of one of those linings at A, Fig. 1. Take strips of lumber one inch thick and 1½ wide; nail in a strip to the side in front, up and down, even with the side, and another back in the corner, and a short piece between them at the bot-

tom. This bottom-piece must have a passage cut out of the bottom of the piece for a bee-passage. We line up on the inside with half-inch lumber. If the lumber is dry, put it from front to rear.

About those bee-passages, or entrances, through the lining: We want for each hole a block 1½ inches thick, about three or four inches square. Bore a 1½-inch hole through it; put those blocks in between the side and the lining, to correspond with the holes through the side, and nail through the lining to hold them in place. Fill in between the outside of the hive and inside lining with some kind of packing. We use chaff, well packed in, as we are putting in the lining. Put a piece 1½ inches on top of the chaff, so the lining will be even with the top of the hive. We nail a 1½-inch strip across the open side. Let it reach half across the partition at the left-hand end. This piece is for a tie to hold the side from springing off.

We want two loose cushions, shown at B, Fig. 2. Make them 13½ inches wide, and half as long as the distance from the bottom of the hive up to the top, so they will just slip in under the tie. They will be about 21¼ inches long, 2 inches thick, one side boarded up with half-inch lumber. The other side is covered with cloth. Eight-ounce duck is what we use. Fill them with chaff. On the lower cushion, Fig. 2, B, there are two strips, ⅜ of an inch, nailed (on the board side of the cushion) to secure a passageway for the bees between the cushion and the outside of the comb. Put the cushions in with the board side next to the bees. The movable sides are made in two pieces, cleated at each end. The lower one rests on a cleat that is nailed on the bottom-board, and beveled a little outward to carry off any water that gets into the joint. It is held in place by buttons. The upper half-side rests on the lower one, and has a two-inch cleat across the top, and halved on to the cleats that are on the stationary sides. This cleat helps to hold up the cover. There is a pair of buttons near the top of this door to hold it in place. Fig. 2, H, standing on the ground is one of the honey-boards cleated at each end, made just large enough to cover one of the divisions, when it reaches half way across the partitions. They are laid on loose. Be sure that they lie down tight, so no bees can go under them from one division to another. Those two holes in the board are for a feeder to be set over them, in case we want to feed. We keep the holes covered with wire cloth, when not wanted for feeding. The lower set of frames stands on the bottom of the hive—see Fig. 1. The upper set stands on top of the lower set. We cut strips of perforated zinc 2 inches wide. These we place, one on each side of the lower combs, for the upper frames to stand on.

Hanging on the hive, Fig. 2, is an empty frame, top end down. They are of pine, ⅞×⅞. The bottoms of the side pieces are cut off on a slant, so the frame stands on a point. The top ends are left square. The frames should be 20⅝ inches long. The top-bar is cut 13⅜ inches long from point to point, and projects beyond the side bars (engraving is not strictly correct), and are cut off on a slant of ⅛ of an inch. The bottom and middle bars are 11¼ inches long, cut square. Put the bottom-bar up about an inch from the point of the side-bar, and the middle bar up more than half way. The top-bar is nailed on to the ends of the side-bars. Each end of top-bar should extend ⅜ of an inch beyond the sides.

To keep the frames apart the proper distance, we drive into the back side of the frames four common three-penny nails—two in the top-bar, one near each end, and a nail in each of the side bars about four or five inches up from the bottom. Drive them in so far that the width of the frame and what sticks out of the nail will be 1⅛ inches. In use, set in the first frame with nails back against the back of the hive, and each frame after. The nails will do the spacing. The hive will hold nine frames and the movable cushion.

For a cover (see Fig. 2) we use a board under the eaves, 7 inches wide, the gable board 12 inches at the peak. By reference to the engraving you will see that the cover is in two pieces, and hinged with heavy four-inch strap-iron hinges to hold the two halves together. We put in between the gables two four-inch strips—one on each side of the peak under the roof-boards; nail through the gables into the ends of them. This makes three thicknesses at the ridge, so it will not sag in the middle. When the roof is all done and the hinges on, we next saw the gable-end boards in two in the middle. The two half-roofs are now held together only by the hinges, so that, in working with the bees, we don't have to take the cover off, but turn one half over on to the other half; then we can work two colonies, after which we can reverse the cover, and work the other two. In the winter we fill the top chamber with straw or chaff cushions, but we leave the honey-boards on, putting the filling above the honey-boards.

For a stand to set the hive on we use good strong stakes, three feet long, of good durable timber. We sharpen the ends and drive them into the ground nearly the whole length, so as to leave five inches out. This forms a square of 30 inches. We then drive a fifth stake in the center, after which we level all with a good spirit-level. Nail two four-inch strips of inch lumber across the top of the stakes, 30 inches long, and a short piece on the middle stake; see that the stand is level and out of wind. Then set on the hive. Don't let the ends of the strips stick out beyond the hive. They will take water under, and rot the bottom of the hive. On top of the hive are two of our smokers.

Platteville, Wis., April, 1890. E. FRANCE.

No doubt many of the friends think the shot-tower hive a complicated matter, and some will ask why it is better than an ordinary hive. Perhaps it is not any better for the majority of bee-keepers, but it is certainly larger. The hive is so big, in fact, that the bees never get out of stores, rarely get weak in numbers, and they have so much room they seldom swarm. All these things fit it eminently for an out-apiary, when it is not to be looked at, perhaps, for weeks at a time. Now, I may have got it wrong; but if I am correct, friend F. sometimes takes a barrel of honey from one of these hives at a single visit. In fact, the hive is so well arranged to take care of itself, that a great deal of the time all he has to do with them is to go and get his barrel of honey whenever the bees have gathered the barrel full. Remember, each comb is toward 14x20 inches square, and there are 72 of these great combs in each hive. Now, if these combs should average 5 pounds each, you have your barrel full, and more too. But please do not go and make a great lot of

them to start with. Make one hive and see how you like it. Then make more if you want to. You need not use combs of the dimensions given above, unless you choose. In fact, friend France has a great many hives using the ordinary Langstroth comb instead of the above. In this case he has 80 in the hive instead of 72. Of course, each hive must have four queens. The whole thing is really the tenement hive that was discussed so much perhaps ten or more years ago.

THE WORLD'S FAIR.

DR. MASON MAKES AND CALLS FOR SUGGESTIONS CONCERNING THE EXHIBIT OF BEE-KEEPERS.

I HAVE received several inquiries from readers of GLEANINGS in regard to an apiarian department at the World's Fair in 1893, and have promised to keep the readers of the bee-journals posted, in so far as I can in regard to the matter.

Nothing is yet known as to the plan upon which matters will be conducted; but I have been corresponding with the committee at Chicago, and have been assured that, when the time arrives to lay plans, our specialty will be properly recognized and provided for.

Each State is to have two members on the board of managers. The Ohio members were appointed by the governor three or four days since, and one of them is a resident of Toledo. I saw him the same day he received his appointment, and had a "chat" with him about our desires, and he promised to do all he could for us.

While the managers are getting ready for business, we as bee-keepers ought to mature our plans and be ready to submit them when called for; and that they may be as complete as possible, I suggest that all interested in the success of the apiarian department, whether intending to be exhibitors or not, send me such suggestions as to them may seem appropriate. We all have more or less interest in the success of the enterprise, and no one person is likely to make the best possible plans; but if each will contribute a share we shall not fail in making a grand display—one that shall be a credit to us, and a great public educator.

It seems to me that we ought to improve to the fullest extent the opportunity thus presented to us, to show the world something of the magnitude of our industry; and that, notwithstanding the misrepresentations and frauds practiced on an "unsuspecting public," bee-keeping is an honorable pursuit, and bee-keepers honorable business people.

It is much to be desired that the honey-exhibit be grouped all in one place, and supplies near by in another group, each State and foreign exhibit to be by itself, and cared for by a superintendent who will assign space to exhibitors, and receive and care for such things as are to be placed on exhibition, and not accompanied by the exhibitor. These superintendents should be named by the State bee-keepers' society and confirmed and paid by the State, and should be such men or women as are fitted for the place.

I shall try to have an apiary established on the grounds, the colonies to be in all styles of hives, from the old hollow log up to the most improved styles in use; and near by the apiary a plat of honey-plants in full bloom can be made an added attraction. Such honey-plants as will bear potting could be placed profusely among the honey-exhibits, adding very much to their attractiveness. Such plants as can not be potted can be pressed and mounted, and used in the decoration of the displays. I should like to see such from all parts of the world. I will help by giving the needed instructions to all desiring to aid in the work, but I hope all will bear in mind that I'm doing this work "free gratis for nothing," and will not fail to "inclose stamp" in all cases where a reply is needed.

There is lots of work ahead, and I hope each will lend a "helping hand," and send on suggestions, and not wait a year or two, for plans and arrangements will probably be largely made within a few months; and if I should need to meet with the managers of the fair in Chicago in a few weeks or months, I shall want to know the minds and wishes of those interested, and be prepared to present matters in the best way. So, send on the suggestions.

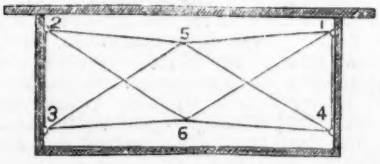
One party has already written that he will make a display of the finest bees the world can produce, and will work to that end from now on. Send on the suggestions; for 'f 'm to take the lead in the matter I shall just b · your servant to carry out your wishes. A. B. MASON.

Auburndale, O., May, 1890.

WIRING FRAMES.

A NOVEL AND PRACTICAL METHOD.

I HAVE just been timing my boy wire Langstroth frames my improved way, and it's such an improvement on the old way that a brief description may benefit some of your many readers. Much has of late appeared in bee-periodicals upon the subject, and many able bee-keepers think it does not pay, for the reason a novice can not do it; that it must be done by skilled labor, and that costs money. My boy has just wired 10 frames in 15 minutes, while I held the watch, which would be equivalent to 400 per day. Not a very difficult job, is it? I had W. T. Falconer make me a lot of frames—sides, ends, and bottom-pieces, ⅞ inch thick, comb-guide left out; ⅜-inch blind-staples are driven into the end-piece, the top one being ⅞ of an inch from the top, and the bottom one ½ inch from the bottom-bar. A small wire nail held in the blind-staple when driving in makes them all uniform in depth. Now put the frame together and fasten it in a clamp, see cut, having the inside of



E. D. KEENEY'S NEW WAY OF WIRING FRAMES.

the frame open space. Now measure off from your coil of wire (not spools, for that kinks and bothers) 2½ times the length of your arm, or from your nose to the ends of your fingers (noses vary some), and this will be within a few inches of the required length. Now put one end *up* through No. 1 staple, down through No. 2, up through No. 3, down

through No. 4, and fasten. Now draw the wire tight from 4 to 3, back to 2 and 1, at each staple pulling the wire up or down to fasten it and keep it tense.

Now take the other end of the wire and run it over the wire at No. 5, and to No. 3 staple; draw until the wire has the angle shown in cut. Give the wire a little pull up or down, to fasten; then pass to No. 2, thence under the wire at No. 6, and back to staple No. 1, and fasten. You now have a frame whose whole weight is held by the end instead of top bars, which does away with all sagging top-bars. With foundation cut the exact size of inside of frames, fastened well on these wires, there has never been with me an iota of sag. In fastening I use melted beeswax with brush to tack the foundation edges to the frame, that it might be exactly in the center, top, bottom, and ends, when done. This way has given me several thousand frames of comb, as even and true as so many boards, and I have yet to see the first top-bar sag. I have tried the same thing with the *regular* thickness of L. or S. frame, and found them too light; but ⅞ thick, all the way round, is just right.

Arcade, N. Y. E. D. KEENEY.

Our friend's letter came some time ago. When I first read it I did not think much of the plan; but when I examined it a little more closely, I became convinced that it was *a good thing*—yes, the best method of wiring that has ever been proposed, in my humble judgment; and this opinion is shared by the others of the establishment—A. I. Root included. The frame is very securely and thoroughly wired, and yet without the least particle of bowing of top or bottom bars, or even end-bars. The whole thing is held by four staples, or, preferably, hooked nails. The plan is exceedingly ingenious; and whether friend K. was the first to suggest it or not, he deserves the thanks of bee-keepers for demonstrating its practicability, and for calling our attention to the matter. The great point of superiority in this method of wiring is, that the strain comes at the four corners—points at which there is the greatest strength in the frame. The weight is taken entirely off the top-bar. Theoretically there can be no sagging, because the points of the wires, 5 and 6, are so firmly braced in such a position in the comb that the center is securely supported, and, as far as practice is concerned, observe that Mr. K. says that his method has given him "several thousand combs, as even and true as so many boards." "And," he adds further, "I have yet to see the first top-bar sag." This is remarkable, as he uses them only ⅞ inch thick. Besides this it combines the advantages of the horizontal and perpendicular wiring. Unlike the plain horizontal wiring it can not bow out, as has been spoken of by some of our correspondents; and, unlike the perpendicular wires, it does not pull down the top-bar. Mr. K. says that his little boy can wire at the rate of 40 an hour. With the perpendicular plan we have been using, our experts think they do very well if they get 25 an hour. If our friend will excuse me, I want to make what I deem an improvement on his plan. Instead of using staples, which are liable to pull out, as I have found by experience, use 1¼-inch wire nails driven through from the outside. They will then project inside an inch. With round-nose pliers form a hook on the end. It will be evident that it will be much more rapid to wire *on hooks* than to *thread through* staples. Our friend has to retrace his wiring at one end of the frame. To avoid all retracing, and to make all wiring sustain the foundation, and to overcome the inconvenience of one long wire kinking, use two wires, both of which will be very nearly the same length. Commence wiring at 1, then pass to 2, 3, and 4 successively. At the latter point, fasten; start with the other wire from point 3; pass over wire 5, hooks 4 and 1, thence under the wire at 6, and back again to 2, and fasten. I have tried friend K.'s plan and the one just outlined, and find that I can not only wire a great deal faster, but a great deal neater and better, and at the same time avoid all retracing. My nails stick out far enough so that the perpendicular wires on the side help support the foundation against the end-bar. With such a frame we have two perpendiculars and eight diagonals. We avoid the bowing or sagging of any of the bars, and can dispense, best of all, with that naughty folded tin bar. It is not even necessary to have the frames pierced. The plan can be applied to any frame, with thin or thick top-bars, or double top-bars. There may be some objections to the plan, which I have not yet seen. Within the next few days we shall test it thoroughly in our apiary. If you do not see the advantage of this method of wiring, take four 1¼-inch wire nails, and wire in the manner I have described above. If you do not feel enthusiastic over it after looking at the nice work, and the rigidity, I shall miss my guess. ERNEST.

In addition to what Ernest has said, I want to call more special attention to the perpendicular wires parallel with the end-bars. When we first commenced wiring frames we had a space of perhaps 2 inches between the last up-and-down wire and the end-bar. Very soon they told us there must be an up-and-down wire within half an inch of the end-bar of the frame, or else the sheets of wax would swing around, away from the wood. With the 1¼-inch wire nails it is an easy matter to make these up-and-down wires just ½ inch from the end-bar.

THE BEAN-WEEVIL.

A SERIOUS DANGER THAT THREATENS BEAN-GROWERS AND BEAN-CONSUMERS.

I HAVE a letter from C. F. Parker, Chattanooga, Tenn., in which he incloses beans infested with the bean-weevil—*Bronchus obsoletus*. He requests me to describe the life-history of this beetle, in GLEANINGS; to state where the eggs are laid, and to give, if possible, some cure for the evil. Mr. P. remarks that lima—in fact, all kinds of beans—are subject to attack.

This little beetle is hardly more than 3 *mm.* (⅛ inch) long, and has a beak, hence the name weevil. All weevils have a more or less prominent snout. The back looks yellowish gray, from the hairs that

densely cover it. On the wing-covers are longitudinal stripes of darker, lighter color alternating with each other. These bands are separated by a narrow black line of punctures, which looks very much like a seam on a garment. There are ten of these bands on each wing-cover. The head and thorax are quite uniformly yellowish gray over the entire surface. The eyes are black. The antennæ are brown at the base and at tip. These horn-like organs slightly enlarge toward the end. The enlarged club is black, except the last joint, which is brown. Beneath, the color is gray, with a tendency to brown, which is marked at the tip of the abdomen and the outer half of the legs. The wing-covers appear shortened, and the abdomen is truncated, or cut off at the end. It does not run to a point, as seen in most beetles.

This beetle passes the winter in the beans. Like most weevils it comes forth some time before it can lay its eggs. It may often be seen flying as we plant or sow our beans, yet waits till the pods are formed before it lays its eggs, when it lays several, often, opposite each bean. The eggs hatch, and the footless, maggot-like grubs, feed upon the rich substance of the beans. They usually leave the germ, so that the bean, though hollowed out by the insects, may grow if planted. In the beans the grubs grow and mature unless eaten by man or beast; and, snugly packed in the tunnel which they have formed by their own food-taking, they pass the winter, and the round of life is completed. We see that these beetles much resemble the pea-weevil, except that the latter are much larger, and but one weevil is found in a single pea.

HOW TO FIGHT THEM.

Bisulphide of carbon, one of the best and most powerful of insecticides, is the best remedy for these pests of the gardener. In Northern New York the growers of peas and beans have special houses in which to use this liquid in killing the weevils. D. M. Ferry & Co., of Detroit, use tight boxes or casks for the same purpose. The beans are put into the box or barrel; some of the liquid—a little goes a long way—is poured in and all closely covered, with an oil cloth or buffalo robe. The liquid volatilizes; and as it is much heavier than air it penetrates to every insect and kills all. The only caution to be observed is to be careful of fire. The vapor is very inflammable, and, when mixed with air, very explosive; so in using, all fire, like a lighted cigar or a lighted match, must be kept away till ventilation disperses the vapors. As the vapor is very odorous, it is easy to know when danger is past. If no odor is observed, no danger need be feared. This bisulphide of carbon is much used. It is a solvent of rubber, and so is used in shoeshops to patch boots. It is much used to extract oils from seeds; and on the western prairies it is used by the farmers to destroy the prairie-dogs. A cotton ball saturated with it is thrown into the hole, and the latter stopped air-tight by use of earth. I have used it, as before explained in GLEANINGS, to kill ants.

There has been much discussion as to whether beans and peas hollowed out by weevils would sprout and grow. The truth is, that some will and some will not. It is certainly true, that all would do better if sound; but some varieties will germinate and make a fair growth, even if eaten by the weevils, while other varieties will utterly fail if they have been tunneled by the insects. So here is another case of the shield. Our impression will depend upon the side seen. If one has grown certain varieties, he knows that buggy peas are ruined for planting; another planted a different variety, and is just as sure that the exact reverse is true.

After writing the foregoing, Prof. Cook writes again, which we append below:

Well, friend Root, this is curious. I have just looked over GLEANINGS for April 1, p. 257, and note your request to write up the bean-weevil, after I have sent you an article with its illustration. I do not need to tell you that life keeps getting busier. With my large regular classes—two lectures a day—laboratory work, experiment station, museum, correspondence, and reading, I find little time, at least for mischief. Thus it is that GLEANINGS did not receive attention till this morning.

The late D. B. Walsh said that a good way to save wormy apples is to make cider of them. A noted horticulturalist of Wisconsin said he did not mind the second brood of cabbage-worms—the ones that tunnel away into the head. "'Cause why?" says he: "I use the cabbages for *sauer kraut*." So there is a way to prevent damage from bean and pea weevils that I did not mention; that is, to eat the vegetables while green. This method gives a double advantage: It saves the beans and gives us a mixed diet.

You are quite right in your suggestion. As I state in my article, most weevils come before the vegetables, fruit, or grain, which they attack, so they await its appearance; but they are not likely to remain long after the nidus for the eggs comes to hand. The plum curculio is usually gone before July; so the pea and bean weevils attack only the early beans and peas, and the late sown are generally free. If all were sown late, the escape would not come. The danger of late-sown beans not maturing makes this remedy less practical.

You are also quite right in your suggestion that the insects will not harm the mature beans. They have done all direct damage when they leave the hollowed-out beans. Their further mischief is wholly prospective, and can take effect only upon the green vegetables—the pods where they lay their eggs.

I will send you our Experimental Station Bulletin No. 58, which gives quite fully the method of killing such insects by use of bisulphide of carbon. This bulletin describes all our important insecticides, and tells how, when, and where to use them.

A. J. COOK.

Agricultural College, Mich., April 8.

Your remedy, friend C., I think will answer our purpose. We have been killing the bugs, as fast as they got out of the beans, with Persian insect-powder; but I did not know that any thing could be used to kill them *before* they get out. We have picked our beans over, again and again, until the labor seemed to be more than they were worth. I then told the women to look at them every day, for a couple of weeks, and see if the bugs continued to come out; so, picking beans over by hand is hardly a practical remedy. Neither would it do to

sell such beans for table use; and if they are unfit to plant, we might as well boil them for the pigs and chickens. Our only safeguard, for the present, I suppose, would be to plant them late. Is it not a little strange that weevils in beans have never been known until within a very few years past? Can you tell us about how much bisulphide of carbon will be required for, say, a bushel of beans?

BUGGY PEAS AND BEANS.

When I was a small boy, 35 or 40 years ago, my father used to sow a few peas about the tenth of June, so they would not be buggy, and he could have them to cook dry. He raised only black-eyed marrowfats, and sowed broadcast. By sowing late, the bugs, or weevils, rather, were out of the way before the peas were advanced far enough for them to deposit their eggs. I sow several kinds of peas, and invariably find the earlier ones most infested by beetles. I had one season's experience with the bean-weevil when I lived in New Jersey, and I had plenty of them. They look some alike, but are evidently quite different. In peas we generally find but one, and the germ is seldom destroyed, so buggy peas may be planted with the assurance that they will grow with right conditions. The beans frequently had five or six weevils in them. They were not as large as the pea-weevil, but perhaps they did not get enough to eat to make them as large. Late-planted peas are unseasonable. They do not grow or bear as well, and are very liable to mildew. Late-planted beans do better, as they like to grow in the warmest weather. I frequently plant them away up here in New Hampshire the first of July, and get a crop. I never saw a bean-weevil in this State. J. L. HUBBARD.

Walpole, N. H., Apr. 7.

ARRANGEMENT OF HIVES.

FRIEND HATCH CONSIDERS THE MATTER.

To facilitate operations in the apiary there is no system of arranging hives that equals straight rows. Other plans may be more picturesque; and to him who wants to make a big show, the other plans give a better chance; but for the man who keeps bees for the pay there is in it, it gives points of advantage over any other plan of arrangement.

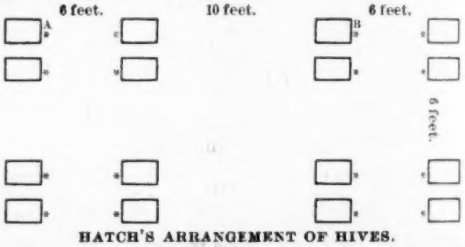
When examining them in a casual manner after setting out in the spring for indications of robbing, loss of queen, as indicated by signs well known to all practical bee-keepers, how much easier it is to walk along the row and examine each entrance and dooryard in regular course than to go from one hive to another, and then not know when you are through! And in swarming time, how much easier to watch for swarms when they are all arranged so you can, at one or two inspections, taking but a glance for each row, determine whether a swarm is coming out or not! and how much easier to find where a swarm came from, if one has come out and alighted while you were at dinner!

In taking off and putting on supers, the advantages are more apparent. Well I remember the backings, turnings, and twistings I had to go through with in trying to get the wheelbarrow close to some hive when I used to arrange my hives hap-hazard, trying to get each at least six feet away from any other, and facing a different way from its immediate neighbor; but with all my care in trying to dodge hives, one would now and then get a "tunk" from some unexpected corner of the wheelbarrow, and I would have to get the penalty in sharp reminders to be more careful next time.

The advantages of the straight-row system may be summed up in — compactness, requiring less room for a given number; ease of accessibility, and best arrangement for inspection.

The old plan of putting hives in straight rows with fixed distances, and all facing one way, has its objections, which are apparent to any one acquainted with the habits of bees, and are not necessary to give here.

I have been using, for two years, a plan that, so far, has developed no defects, and I am indebted to that excellent little book of Dr. Miller's, "A Year Among the Bees," for part of it; i. e., the arrangement in pairs, which is quite an advantage; but I do not like his plan of placing the entrances all one way; and I like each hive to stand on its own support, independent of any other, and I want that stand smaller than the hive, so that, in working close to the hive, there is not so much danger of hitting the stand with the toe of one's boot, to jar the bees. The objection to facing the hives all one way is, that, while you are working at one hive, you are right in the line of flight of the next row in the rear of the one you are working with. The following diagram shows a better arrangement, as two years' experience has proven.



HATCH'S ARRANGEMENT OF HIVES.

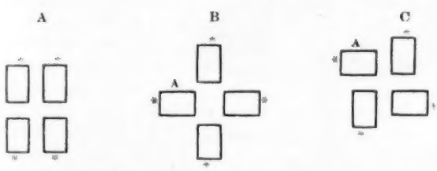
The squares are for hives, with a star to indicate entrances. Hives are to face east and west alternately, in rows; alleys between entrances, 6 feet; alleys between hives, at backs, 10 feet, which is the work alley, the one to run the wheelbarrow in, and to travel back and forth in. You will observe that, while you are in this alley, you are 10 to 15 feet away from the face of any hive, and therefore the bees in their outward flight are far above your head, where they will not annoy you nor you them. If you wish to see the difference this makes, you have but to step over into the other alley, and stand a few minutes, to be convinced.

As to mixing of bees, and queens mistaking hives, although your hives may be as much alike as two peas you will see, by referring to the hives marked A and B, that a bee or queen, to find a hive in just the same position as her own, has to go across two alleys, and 20 feet away—a mistake she is not likely to make, the location alone determining her home. In fact, there has been less trouble from bees and queens mistaking hives with this than the old hap-hazard arrangement. I think a fair trial will convince any one of its merits. C. A. HATCH.

Ithaca, Wis., Mar. 11.

Your article, friend Hatch, is timely and to the point. I have been studying on this

matter of arranging hives in the apiary, for some time. I have never liked the hexagonal arrangement in our home yard, with grapevines. I thought they were too close; and so when we got down to the basswood apiary we put the hives 12 feet apart, all facing one way, each hive in the shade of a basswood-tree. Much to my surprise I found it took a good deal of time in running from one hive to another. I then came to the conclusion that we wanted them closer together. Accordingly, this spring when we set our bees out of the cellar I arranged the hives in groups of four—hives 12 inches apart, and the groups 6 feet apart. The first group was made like A, the next like B, and so on, each one differing from the other. On the next row we start with C just opposite A. By this arrangement you will see that the entrances were facing in all directions, so the bees could not mistake where they lived. I thought it was very unique, and so I was quite sanguine I should like it. But after I had worked among the bees as so arranged, I became very much disgusted. I could not sit down to work at a hive anywhere without encountering the flight of bees, especially when I took a positoin at A, at groups B and C. The bees, seeing some great object



in the midst of their groups, would stop, hesitate, buzz around, and fill the air. This is, to a certain extent, true when working over one hive; but it is four times as bad when the entrances of the four hives are close together. Group A does very well. But if all were like this it would offer no dissimilar arrangement for the bees. I have been trying to think of some better arrangement, and your plan strikes me as the best of any thing I have yet seen. When our out-apiary is set out for this season I propose arranging it on just that plan exactly. The fact that it is similar to Dr. Miller's arrangement, and the fact that you are one of the most extensive bee-keepers of your State, and that you like it, is much in its favor. The plan of avoiding the flight of bees, in going about with wheelbarrows and such like, is capital. There is one thing which you have omitted to mention; and that is, the facility with which a lawn-mower can be run among hives that are parallel and square, instead of hap-hazard, or on the hexagonal plan. In our hexagonal apiary it is very inconvenient to run a lawn-mower around among the hives, because one hive comes directly in the passageway of the next row. We were obliged to run it zigzag; and we found, several times, that we had thereby given a hive an unlucky "tunk," as you so happily express it. With your arrangement a lawn-mower could be run straight along, clear through the rows, without any zigzag about it. On three sides you would not encounter any entrance. At night the entrance sides should be mown down, when the bees are not flying. Perhaps a good many apiarists do not think it necessary to keep the grass down with a lawn-mower. Of all things I do hate, it is to wade through wet grass, when the dew has been heavy the night previous, in making visitations to the hives. It is only a couple of hours' work a week to run a lawn-mower through a whole apiary of, say, 75 or 100 colonies; and, aside from the neat and orderly appearance, it pays in other ways, for it keeps the bottoms of the trowsers dry, and makes it necessary to wear only rubbers We should be glad to get suggestions from our correspondents. E. R.

In addition to the above, permit me to say that, in most of the California apiaries, they have come to the same conclusion with friend Hatch; that is, having narrow alleys set apart for a pathway or thoroughfare for the bees. The operator is not supposed to go into these narrow alleys at all. As nearly as I can remember, 6 feet was perhaps the width of these; then a broader alley, say 10 or 12 feet, was left for the operator. Of course, he can cross from one broad alley to another, if he chooses; but his general work is to be done in the broad alley; and in opening hives and working with them, the narrow alleys are not to be occupied. The bees seem to recognize this narrow alley as their own allotted highway; and when they are working heavily the narrow alleys are literally full of buzzing bees, while the broad ones are comparatively free. These double rows of hives with a double alley between them, may center, like the spokes of a wheel, toward the door of the honey-house. I would suggest to friend Hatch that his hives may be in straight rows, and still be on the hexagonal plan; and this plan gives each hive a greater amount of space than we can get in any other way.

CRATING AND MARKETING HONEY.

Continued from last issue.

I HARDLY know whether this fact should be more emphasized or not; at all events, hardly any one likes candied comb honey whether they understand its nature or not, and people who don't understand this crystallizing property of honey say instantly, "Oh! that is manufactured honey, isn't it?" or another says, "That is some sugar you have put in." These friends compare the retail price of honey, 18 and 20 cts., with the price of sugar, 7 and 8 cts., and think there is an immense profit to us in turning sugar thus into honey. Of course, they don't know, nor can we very well explain, that the wholesale price of honey in barrels is about the same as good sugar, thus making it out of the question to adulterate honey profitably. Glucose makes an unpalatable mixture, and can't be counted.

Right here, while speaking of the price of honey, I wish to call some of our dear brethren to account for selling honey so cheaply. One brother sold ¾-lb. glass tumblers for $1.00 per dozen in Toledo. The tumblers cost, any way, 30 cts. per dozen, wholesale, leaving a little less than 8 cts. per lb. for

the honey, put up in small receptacles. Another of our bee-keeping friends has been putting up pint Masons (holding 1½ lbs.) for 20 cts. each, by the dozen. If he gets his jars for 6 cts. each by the gross he is lucky, leaving 14 cts. for 1½-lbs. of honey, and labor of filling, etc. Now, we have disposed of nearly 30,000 lbs. of honey in the past two years, and the bulk of it has been sold at 18 to 20 cts. per lb., and we charge extra for the glass jars. We have sold honey thus in Cleveland, Canton, Akron, Massillon, Newark, Zanesville, Columbus, Findlay, Tiffin, and several other Ohio towns, and in Logansport, Lafayette, Ft. Wayne, and Indianapolis, in Hoosierdom. The above is our uniform experience.

It is next to impossible to find a lot of comb honey that has no pollen in some of the cells. In some way I can not explain, this is an attraction for the moth, and many a disgusting task I have had of cleaning them out of a lot of nice comb honey. To avoid this, sulphur them, of course; but just when to do this with most profit to all concerned, I know not. Perhaps some brother who has had experience in this particular line will kindly inform us.

One thing in regard to the general appearance and quality of honey. Let our bee-keeping friends remember that grocers as a rule will have nice, neat-looking white honey or have none at all. What kind of appearance do you suppose honey presents with all the bee-glue on it, as when removed from the hive? In several instances I have seen comb honey that had been shipped to market in the very cases that held it on the hive, with all the unsightly bee-glue adhering. Why, such a thing is as much behind the advanced spirit of the times as the stage coach or the wooden plow. Let us all remember that beauty and neatness are prime requisites for success in any line of goods we present to the public. People living in our cities have the importance of this matter impressed on them at every hand, and here competition is swift in inventing new and artistic effects. Our farmer friends must bear in mind that this is the class of people who approve or condemn their methods, and use no charity in so doing, but adopt the rigid rule of comparison.

Once for all, let me say, send no dark honey to our city markets. Practically, no one wants it; and you can make more money out of it by feeding in spring to your bees or marketing to private families through the country.

The only way to fight these *infamous lies*, in circulation about the bee-business, is for each one of us to write articles for our home, county, and local papers, where our word is taken as authority. The persistence and scope of these misstatements, no one can fully realize who has never sold honey in the cities and away from home. There would be 100,000 lbs. more honey eaten per year if all who like honey had confidence in what is offered them.

An eminent financier has said, "Confidence is the life of trade," and this is eminently so in the bee and honey business. My brother said once, "If any one ever ate any good honey, and had the slightest suspicion that *we* sold it, he will buy more, without question." H. F. MOORE.

Cleveland, O., Apr. 4.

Friend M., you do not mention our reward cards for these people, but I suppose you have them. I am glad of your caution in regard to unfinished sections of the previous year. This has been quite thoroughly discussed in our conventions, but a great many don't seem to get hold of the whole of it. I am sure the old honey, section and all, had better be thrown away, unless every particle can be cleaned out of the cells by the bees, so as to leave nothing that can start the new honey to candying. Throwing honey out by means of the extractor will not answer. It must be given to the bees to clean off afterward. Our experience with dark honey has been just about what you say. Nobody wants it at all.

A HOME-MADE EXTRACTOR.

ITS MERITS AND DEMERITS.

I INCLOSE with this a photograph of my extractor. It is composed of eight pieces, all of which, or a substitute for most of them, are generally obtainable by what I call an amateur bee-keeper; for instance, a hickory sapling, a few boards nailed together, and the corners cut off, take the place of the wheel; and with ½-inch lumber a box might be made to take the place of the can, or the can might be made from two old five-gallon square honey-cans. For my device I took a long stout pole. The wheel I used was the front wheel of a light wagon. I cut the pole down to 7 feet, the height adapted to my cellar. In the bottom of the pole I drove an iron plug ⅛ inch in diameter, allowing it to extend about 1¼ inches outside. I then bored a 1¼-inch hole through a piece of hard wood, long enough to be nailed on two joists overhead. I then bored a ⅝ hole in a piece of hard wood, one inch thick and a foot long. I drop a piece of thick tin into this to form a resting-place for the spindle; and having got the pole plumb, I screwed this to the floor. I then put the pole through the wheel, the inside of the hub toward the bottom of the pole, and placed it in position. I next bored a hole 4 inches from the bottom, stuck the end of a ten-foot sash cord through it, knotted it, and attached a 3-inch ring to the other, and wound the cord around it to try how it would work (see cut). The rest will be evident from the cut.

We will suppose a friend should call to see me during a honey season, and I should like to give him a taste of honey, none in the house. Well, such is my disposition that, if I had a regular extractor stored away, I would get it down to extract a single frame, to stand treat. Nearly the contents of a 3-lb. frame would stick to it, and a nice job to clean it, while the other can would not waste 2 ounces. Honey could be cleaned with a quart of water, and dried in less than half an hour.

Philadelphia, March 8. S. STOUT.

Friend S., the arrangement you give is substantially very old. The "Rapid" honey-extractor, in the *British Bee Journal*,

some years ago, was on the same plan. While you can extract honey with such an arrangement, especially if you have a few hives, it is not only a very laborious way, but very fatiguing, where very much of it is to be done. It is true, that the honey is thrown into a single tin can, and nowhere else; but a single tin can can be used in any ordinary extractor, where you wish to extract only one comb, or, say, two combs, or more. The objection is, that it forms what is called a revolving-can extractor. The honey swings around with the comb, instead of being thrown out against a stationary can; and as soon as you swing very much honey in this way you will find it very laborious. Every comb that is emptied will necessitate stopping and pouring honey out of the can or cans. I would suggest that, if you are going to use such a machine, instead of a wagon-wheel and hickory sapling, you use simply a light iron or steel rod, with some kind of metal wheel not weighing over a pound.

GEORGIA FOR BEES.

AN A B C SCHOLAR'S EXPERIENCE.

ONE of my brothers has been keeping bees in this county for over six years, but he has never made bee-keeping a specialty. He commenced with only 13 colonies of the golden-banded Italians, and increased to 35 colonies, and sold $335 worth of honey from them the first year. But as he has been engaged in farming and merchandizing ever since, he has not given them very much attention.

I believe this to be the best country for bees in the South, as we have a large number of honey-producing flowers in bloom here every month in the year, from January until November; and they are no trouble to winter.

Our winters are never cold enough to stop our bees from work. They usually commence to gather pollen in January, and never cease till December. The honey season commences about the first of April, and we take off surplus until the 15th of July. Our honey-producing plants and trees are the yellow jessamine, ground-huckleberry, gallberry, persimmon, magnolia, bay, poplar, and horsemint, and a large number of others whose names are unknown to me. Over two-thirds of our honey is made from the gallberry-bush, which commences to bloom about the 20th of April, and continues in bloom until the middle of June. Our apiary is situated in the center of a gallberry-forest, out in the country, three miles from Sasser, in

"A populous solitude of bees and birds,
And fairy formed and many-colored things."

And while the gallberries are in bloom the bees work from daylight until dark. It is in full bloom now, and it is a pretty sight to see how busy the little creatures are.

GALLBERRY HONEY.

This is the prettiest I ever saw. It is well flavored, very thick, and as translucent as the classic product of Hymettus. I took 52 pounds of as pretty sealed gallberry honey from an upper story yesterday as I ever saw, and I could easily extract 25 lbs. from any hive in our apiary. It is all this year's honey too. I expect to commence extracting in a week.

Mr. Root, I am one of your A B C boys, and will let you hear from me again soon.

WALTER L. ANTHONY.

Sasser, Terrell Co., Ga., May 6.

We have had of late some inquiry in regard to Georgia as a bee-country. The above will doubtless give the information needed.

HONEY-CIDER VINEGAR, ETC.

PUTTING REFUSE HONEY INTO THE VINEGAR-BARREL, ETC.

Dear Gleanings:—Your pages fall under the eyes of multitudes of people, embracing many shades of thought, and representing a great variety of interests. Though the chief interest centers in the busy bee, your readers are treated to other sources of vital interest to society, and to individuals. There really appears to be a great big GLEANINGS family who are all trying to help each other. The question, "What business shall we connect with apiarian management?" is a prolific one, and has had much interesting discussion in your pages.

I entered the GLEANINGS family in 1887, with 30 colonies; and however fascinating be the occupation, I need not even hint to any of those who record their honey gains in tons, how very essential a thing it is to us who would like to be bee men, to have a side show occupation until the big honey business would materialize.

In 1888 I moved my apiary from Indianapolis to North Vernon, Jennings Co., and to this city in 1889. Through these years and changes our honey product has slightly exceeded a liberal supply on my own table. My great lack of success has come from the ravages of that loathsome disease, foul brood. My stocks have decreased to 14 colonies, "spring count." I have just made a purchase of a fine old farm. Yesterday my little "wicked" busy bees bid good-by to city life, and to-day I liberated them under the spreading branches of an apple-orchard full of bloom; and this brings me to the thought which prompted this article. GLEANINGS is authority for the quality of honey vinegar. We are here surrounded by a prolific, never-failing fruit-crop. Fruit makes cider; cider makes vinegar; cider vinegar, known to be such, always commands ready sale at the best quotations. I put the question, "Will cider and honey vinegar combine?" Both are known to be in quality par excellent. Neither would be an adulteration of the other. The brand would be improved—honey-cider vinegar. I am told that honey enters largely into the manufacture of the plug from the wickedest weed in the world. Of course, the name of honey associated with the vile stuff helps the sale of it to those who indulge in such nastiness. Would it not be a humper in aiding the sale of pure vinegar? Can any one tell?

JOHN CADWALLADER.

Madison, Ind., Apr. 26.

Friend C., I am happy to tell you that we have been in the habit of putting our refuse honey into our cider vinegar for some time, and it improves it amazingly—sometimes to the extent of making it so sharp that nobody can use the vinegar without first diluting it. When they put it on the lettuce in our dining-room, I have remonstrated several times because they did not dilute it more. It would fairly take the skin off

your lips and tongue. Perhaps a better way would be to put water with the honey before it is added to the vinegar, to avoid having it too strong.

HEADS OF GRAIN

FROM DIFFERENT FIELDS.

A PASTE FOR STICKING HONEY-LABELS ON TIN.

In GLEANINGS for April 15 I noticed an inquiry for a paste to stick labels on tin. I find the following *very* satisfactory: Flour, 1 lb.; gum arabic, 2½ oz.; sugar lead, powdered, 1½ oz.; alum, 1½ oz.; water, 2 qts. The gum, sugar lead, and alum, are dissolved in the water, then proceed as when making ordinary flour paste. Scratching the tin with sandpaper, or washing with diluted muriatic acid, is also helpful. One of our amateur photographers likes this paste very much. J. F. BARTON.

Chicago, Ill., April 21, 1890.

And here are a couple more lette s on the same subject:

You inquire how to make labels stick to tin pails. I have put on a great many this winter. The best way I find is to use common flour paste, well cooked, then rub the label hard with a dry cloth after it is on the pail; rub it down smooth, let it dry, and it will stay as long as the pail lasts, unless you wash it off. Mucilage will not stick well.

Jackson, Mich., Apr. 4. W. D. SOPER.

To make labels stick to new tin with ordinary paste, rub a sliced onion over the tin.

Evansville, Ind., Apr. 17. L. A. WILKES.

SPRAYING OF FRUIT-TREES AND KILLING OF BEES.

I write you for information in regard to the spraying of fruit-trees with poison. There are persons, malicious and ignorant, who will not yield to any proofs, but persist in spraying their trees while the blossoms are on, and poisoning the bees. One man in this neighborhood had his bees ruined for this season, and mine are dying off daily from the effects of poison. What I wish to ask is, whether there is any remedy through the law by which such persons can be made to quit it.

Millbury, O., May 2. GEO. W. CHAPMAN.

Friend C., if your neighbors poison your bees they render themselves liable, in the same way they would if they poisoned your chickens or larger animals; and if it can be shown that there is no necessity for spraying the trees while they are in blossom, we shall have a pretty clear case against them. The professors in our agricultural colleges and experiment stations will back us up in the matter, and perhaps the Bee-keepers' Union may decide to take hold of it, if it comes to litigation. I would, however, have a friendly talk with your neighbors in regard to it, and show them what Prof. Cook has written on the subject.

DECOY HIVES NOT ALLOWED BY LAW IN CONNECTICUT.

There is a law in this State that makes the setting-out of a bee-hive in the woods, or anywhere else, for the purpose of catching runaway bees, a misdemeanor, punishable by fine or imprisonment. Now, what we should like to know is, can it possibly work any injury to my neighbor who keeps bees? Does it in any way entice them to abscond? We claim not. But we claim, rather, it is a humane act; for why is it not better for the little fellows to have a decent place to set up housekeeping in than to have them waste their time and strength in cleaning out some old hollow tree? Now, I regard my neighbor's rights as sacred as my own, and more so. What we should like to know is, whether it can work him any harm to set out hives as I have stated. I hope you will not cast this aside without a reply. I think the law a foolish one, conceived in spite.

Middlebury, Conn., April 28. R. B. WHEATON.

Friend W., I was aware that such a law had been passed; but I pronounced it at the outset a foolish, unnecessary law, and I objected to it at the time it was brought up at one of our conventions. The enactment of such laws, where no law is needed, is one great reason why we have so many laws that are a dead letter. If I wanted to set out decoy hives in the woods or anywhere else, I would do so, and no one, surely, would make any complaint unless it would be some foolish fellow who has got cranky on the subject.

FOUR-BANDED ITALIAN BEES.

I send a sample of my "so-called four-banded bees." Will you please be kind enough to examine them carefully and tell the readers of GLEANINGS whether or not they have four or five yellow bands?

Frenchville, W. Va., Apr. 30. L. L. HEARN.

Friend H., the Italian bees you send us in a Peet cage, mentioned above, when placed on a window, show distinctly four yellow bands. The fourth band is not the downy fuzz so often called a yellow band, but the horny scale of the body itself is, a greater part of it, yellow, just like the second and third bands in ordinary Italians. I do not know that I have ever before seen bees so distinctly marked with this yellow band. Some of them may also show the fifth band, but it is not as clear and unmistakable as the fourth. Perhaps I should say to our readers that I do not consider these extra yellow bands as particular evidence of their purity. It is doubtless the result of careful breeding and careful selection, having yellow bands constantly in view. While these yellow bands distinguish them more plainly than common Italians, from common bees, it does not necessarily follow that they are better honey-gatherers than ordinary Italians. The bees are of a good size, very handsome, and quite docile. I let them out of the cage on the window, so as to see the band more clearly, and put them back, taking them by the wings by my fingers, but none of them offered to sting. We should be glad to have friend H. tell us where he got the stock, and how long he has been getting the above result.

IN FAVOR OF OPEN-SIDE SECTIONS.

Seeing, as I do, in GLEANINGS, occasional and mostly uncomplimentary allusions to open-side sections, I feel called upon to say a word in their favor. During the season of 1888 I produced a little over 6000 lbs. of honey in open-side sections, 4¼ x 4¼, 7 to the foot, and I was very well pleased with them. They were used in a case that clamped

them up firmly together, so that they were propolized only on top and bottom. This propolis was scraped off before removing the sections from the case. I think the trouble in using them has been that the case was not adapted to them. They must be clamped up tight together, so that no propolis can be got in between them. A T super will not do. I am not very much interested in this comb-honey business at present, as about a year ago I decided to run my bees—300 colonies—for extracted honey, yet I dislike very much to see a good thing, like the open-side section, defamed by those who have not given it a fair trial. T. P. ANDREWS.

Farina, Ill., May 5, 1890.

BAD BOYS, AND HOW THEY WERE SERVED.

I went into winter quarters with 119 hives; lost 20, and the boys upset six and rolled some down the hill, and killed three colonies for me. I sold nine others, leaving 87 colonies to commence with this spring, all in good shape, as they commenced breeding early in February and March, and are all getting strong now. The three boys that upset six of my hives and destroyed three, belonged to three different families; so I made their parents pay for the bees $10 for each colony destroyed, $30 in all, and settled it without going to court.

Norristown, Pa., Apr. 19. J. W. SWARTLEY.

Friend S., I think you did exactly right. Where boys tip over bee-hives, or destroy valuable colonies for the small amount of honey they obtain, I think the good of the boys demands they should be made to pay roundly for it.

A LOSS OF 110 OUT OF 161 PUT INTO WINTER QUARTERS, WITH THE DIFFERENCE GREATLY IN FAVOR OF CHAFF HIVES.

I have been watching to see the reports of the losses of bees this spring, but I have seen no report. I have lost 110 out of 161. I put 117 into the cellar. I left 44 outdoors in chaff hives, two of which died this spring. Most of those that were in the cellar were very weak. I set them out twice. There was a good deal of honey-dew last fall. It is cold and backward for bees. There have been big losses through this section. Some have lost more than I have. JAMES MARKLE.

New Salem, N. Y., May 1, 1890.

Your great loss in the cellar, and comparatively small loss in chaff hives, speaks well for the outdoor method, though the past open winter was much more favorable for outdoor wintering. We rather doubt whether the food was the whole source of loss in the cellar. Did your hives have plenty of bottom ventilation, and no top ventilation? Ventilation from an ordinary entrance in cellar is not enough. Another thing: Was your cellar darkened and perfectly dry, and did it maintain a comparatively even temperature? Let us hear from you again. We want to know more about your loss.

THE HOFFMAN FRAME.

Mr. Root:—The wide and thick top-bar is the only one that ought to be used in bee-hives. We have used such for six or seven years, and many near us are falling into line in regard to them. We did not like the brace-combs built above frames, nor the use of burlaps over them, neither the use of honey-boards. The frame we use is a trifle different from the Hoffman-Langstroth, but only in the width and thickness of the top-bar. We call them the Hoffman-Langstroth. The use of wide and thick top-bars allows us to have no use for them, for we can use a plain board that comes off clean. Honey-boards, burlaps, etc., are too much machinery for us. You can do no better than the Hoffman frame, made as we make them. F. A. SALISBURY.

Syracuse, N. Y., Jan. 31, 1890.

You will observe that the frame he describes is quite similar to the modification we spoke of on page 330 of last issue. We are sure that bee-keepers would like to dispense with quilts, honey-boards, burr-combs, and "all sich," and we hope the above frame will enable us to do it.

HONEY-MOONS.

We extract the following from the *American Bee Journal*, as many, like ourselves, may not before have known the origin of the term:

Honey-moon, it is said, is a term of Teutonic origin, and derived from a luxurious drink prepared with honey by the ancients. It was the custom to drink of diluted honey for thirty days, or a moon's age, after a wedding feast. It is good to "keep sweet" for a month after marriage; but it is better when that "sweetness" extends throughout not only the months, but the long years of wedded life.

We heartily indorse friend Newman's closing sentence.

BEES CLUSTERING ON THE EAST SIDE OF THE HIVE.

In examining my bees last week I noticed that in all the four hives the bees were clustered on the *east* side of the hive. Is this usual? I winter out of doors on 8 S. frames, stores on each side of the cluster, 4 frames with the bees in center, 2 frames of honey on each side of cluster. J. F. BARTON.

Chicago, Ill., April 21, 1890.

Friend B., if what you say is true it is because the morning sun has so warmed up your hives as to call the bees over to that side. I have seen them cluster on the south side of a hive in preference to the north, and for a similar reason.

DOUBLE-TOP-BAR FRAMES.

On page 204 is illustrated and described a double-top-bar frame; and in our answer we refer to a sample which we held in our hand, and which, by propolis accumulations, we judged had been used for some time. At the time we did not know from whom it came. The letter, with reference to it, was attached to an order; and as it is now separated we take pleasure in presenting it to our readers. Friend Penton was among the very first to use the double top-bar—perhaps *the* first.

Friend Root:—I send you by mail one of my thick-topped frames, to let you see that there is in practical operation a deep top-bar combining all the advantages called for by the fraternity, unless it be in the width. I have adopted this for the purpose of making more distance between the brood and the upper frames, or sections, the prevention of brace-combs, and the necessity of a honey-board. The queen will never trouble the upper story. The bees will not pile up the bee-space, and, summer or winter, packed or unpacked, the bees have free access to all the combs in the hive. I am aware that, if the top-bars were all of one piece, and cut out

with a wabble saw, they would be stronger and better, but I have no machinery for doing it. I am sure you could sell any amount of them if you made them. CHAS. PENTON.

E. Aurora, N. Y., Feb. 2.

Your suggestion is no doubt valuable. I hold in my hand a top-bar made as you suggest. Instead of using a wabble-saw we simply use one of our thick grooving saws. A slot is cut so as to leave sufficient wood at each end, and also a solid piece in the middle. Yours will be the cheapest way to make a double top-bar; and it will, besides, be considerably stiffer than one made of two pieces of wood.

A LETTER FROM A LITTLE GIRL; PAPA'S SOLAR WAX-EXTRACTOR.

My papa had over 70 hives of bees two years ago. I will try to tell you how we moved them. He filled the horse-cart nearly half full of fine dirt, so they would not be jolted, then placed in as many as the cart would conveniently hold, brought them home, and removed all the others the same way until all the bees had arrived safely at our new home Papa does not "squeeze" the cappings, as some do, but he has an extractor made of a Simplicity hive with a flat cover put on, on hinges, then in the bottom there is a square tin pan 6 in. deep, which catches the wax and honey; above that there is a wire-net cover on which the wax is placed. The good goes down in the pan beneath, while the dead bees and bad wax stay on the wire net, and over that there is a glass cover which throws the heat of the sun down on the wax, and melts it very rapidly. I here draw one as near like it as possible. Papa gives me half of the wax for watching it, and putting and taking out wax when it is needed. Once a high tide came half way up our front yard, and drowned nearly half of our bees.

Church Creek, Md. ELIZA BUSICK, age 12.

MOVING BEES; BAD WORK WITH.

I must give you the benefit of my experience in bee culture. It was many years ago, when I was but a young lad, when a man who kept a number of hives was a laborer for my father. He would be talking everlastingly about how all his bees were thriving. I purchased one hive from him, and left it with his own for two or three years, when the number was increased to six or seven, and may be eight hives. I made as many stools in my father's kitchen garden to place the hives upon them. I inquired of the bee-keeper the best way to remove them. He said, "The road is good, as smooth as a room floor. Bring a large-bottomed cart and towels, and we will fix a towel about each hive, and place them all in the cart; and by driving carefully you will get them home nicely." Home was three miles off. By the time we had gone but half a mile, the honey was dripping through the cart on the road; but as it was useless to stop, we continued our journey. Upon lifting them out of the cart to place them on the previously prepared stools, the works were detached from the hives (made of straw); only two or three could be set on the stools; the rest were all broken-up wax, honey, and bees, all thoroughly mixed up. After getting the household bedded, I placed two washing-tubs before the kitchen fire, took off my coat, rolled up my sleeves (I had been, previous to that, stung so much that I had become heedless of more), took up a handful of the mixture, and picked with my fingers bee after bee into the fire. This was my occupation all the night, and I finished it only when the sun was rising. You will doubtless laugh, but I tell you it was not a laughing job to me at the time, though I have laughed over the matter many a time since.

Washington, D. C., April 10. J. S.

But, friend S., what in the world did you sit up all night for, picking out bees and throwing them into the fire? Did the mashed-up honey you had, pay you for the trouble? It was the towels over the bottom of the hive, shutting off the air, that made the trouble. In removing bees, you want wire cloth. Nothing else is safe, especially when the weather is warm.

WHAT MADE THE BEES SWARM OUT?

My bees have been out for a week, and I have had 7 swarms leave their hive and go in with other swarms. They leave from 20 to 50 lbs. in a hive.

Hammond, Wis., Apr. 4. A. E. BRADFORD.

The swarming out you mention comes under the head of "Absconding in Early Spring," in the first chapter of the A B C book. Bees are more apt to do this when wintered in cellars or special repositories. Yours must have gotten a kind of absconding mania, especially if they had plenty of stores, as you state it.

FALL HONEY, AND BEES IN GOOD CONDITION.

Bees did not do much last year till about September 1, when the fall flowers opened and the bees went at them in earnest, filling their hives with the best fall honey I ever saw. I had several swarms in September, which built their combs and stored honey enough to carry them through the winter—something never known in this country. I have 50 colonies of bees in good condition for spring work.

Mart, N. C., March 17. SUBSCRIBER.

OUR QUESTION-BOX,

With Replies from our best Authorities on Bees.

QUESTION 160.—*A young man having just graduated from college, and living in the vicinity of Central Illinois, has had some experience in managing out-apiaries for a bee-keeper. He desires to keep some two or three apiaries, and teach school during the odd months. He wants to know how much time he will probably have for teaching school, providing he does all the work himself, with the assistance of a horse and wagon, and yet give the bees all the necessary attention.*

I should think about four months.

Cuba. O. O. POPPLETON.

Excepting a few days, he will have from September 1st to April 1st.

Wisconsin. S. E. GEO. GRIMM.

If he purchases all supplies, six months, from October 1st to April 1st.

Michigan. C. A. J. COOK.

He would "probably" know if he should follow out his proposed plan.
Ohio. N. W. A. B. MASON.

I should say six months, if his apiaries do not exceed 100 to the apiary.
California. S. W. R. WILKIN.

Not a day—at least I suspect that from my own experience, unless the apiaries are very small.
Illinois. N. C. C. MILLER.

If by the above is meant during the honey season, none. If the entire year is included, probably from five to six months.
Illinois. MRS. L. HARRISON.

If he makes his own supplies, I should say, "Not any." If he buys his supplies, then perhaps three months during winter.
New York. C. G. M. DOOLITTLE.

If he keeps two or three apiaries, and gives them the necessary attention, it will take more of his time than he will be able to give to a school.
Louisiana. E. C. P. L. VIALLON.

If he works with his bees every Saturday he will be able to care for two or three apiaries during the school months—we mean from September till May.
Illinois. N. W. DADANT & SON.

In a year or two he will probably have twelve months for teaching. With the amount of work he lays out he can do neither himself, school, nor bees, justice, and one or all will fail.
New York. C. P. H. ELWOOD.

If this young man is full of energy I should say he might devote three or four months in winter to teaching at first. He can then decide the question for himself.
Ohio. N. W. H. R. BOARDMAN.

If he has steel nerves and is iron-clad, and requires no rest, he may teach from December till March; but if he is of the same material as other men, he will have no time to teach and do justice to his bees.
Vermont. N. W. A. E. MANUM.

If he keeps "two or three" out-apiaries of a proper size, doing all the work himself and doing it properly, he will probably not be able to teach school more than nine months in the year. Most men would not have any time for school-teaching.
Illinois. N. C. J. A. GREEN.

I think the young man will find that the schools will claim to set the time for him. He will have to push things to get ready to begin the fall term; but I guess he can manage it if he uses his Saturdays to finish up in. The winter term will come all right. The spring term he can hardly take, unless he can find a school accommodating enough to have an unusually short spring term. Thus six or seven months would be his outside lines.
Ohio. N. W. E. E. HASTY.

He can teach during the winter months. Begin, say, November 1st, and teach four months. But if he keeps two or three apiaries of from 60 to 80 colonies, spring count, he can not do all the work himself during the honey season; and then when he gets his third apiary to going in good shape he will find that his school days are over, for there is a great deal of work that can be done in the winter—getting things ready for next year, and selling off his honey, etc.
Wisconsin. S. W. E. FRANCE.

I don't think I would teach any, unless I had to. He might, perhaps, be able to teach the winter months if he buys his hives and fixtures, but it would be well for him to get thoroughly rested during the winter; for if he runs three yards with 100 colonies each, he will have to get around pretty spry during the bee-season if he gives the bees all necessary attention.
Wisconsin. S. W. S. I. FREEBORN.

Let us see. Three apiaries, 100 colonies each, 300. If run for comb honey there will be somewhere near 20,000 sections to prepare, besides hives and many other things. We should therefore say, that, doing all this work himself, there would be but little time for "swinging the birch." If, however, the bees are run for extracted honey, and after each hive has a complement of extra combs and no increase allowed, then from November 1st until April he could devote his time to the profession of pedagogics.
New York. E. RAMBLER.

Now please excuse me for the following reply, because I feel sure you want the truth as I see it. In the first place, this young man's having graduated from college is no sign that he is as well prepared to manage your bees as some young man who has not been to college. In the next place, he does not look upon bee-keeping as I do, if he proposes to manage two or three apiaries and teach school during the "odd months." If he does the work as it should be done, he will have no "odd months" at all, if each apiary contains a sufficient number of bees to be worthy of the name of apiary. In taking bees on shares there is an enormous profit to him who takes them, and a loss to the one who owns them if they are worked on the "kick and a brush" plan. Whoever works apiaries, whether he owns them or not, should do the work well and carefully, seeing to every detail, and should have all of his work done ahead of time. If you aim to keep from one to two weeks ahead of your bees you will probably not get behind at any time; but if you aim to keep just even with them you will probably get a week or two behind just at the time when the greatest loss from such being behind comes in. I want the hustling fellow, with natural ability, and I don't suppose it would hurt him if he had graduated at a college, provided his metal had not been all molded and worked in that college until the temper is all worked out of it.
Michigan. S. W. JAMES HEDDON.

I am much inclined to agree with the friends who think that he should not teach school at all, or else he should not keep bees at all (of course, there are men who can carry on two lines of business at once)—that is, if he wishes to attain a great degree of excellence in either calling; and it seems to me, too, that this young man is starting out pretty large. If I understand him, he has not had experience in handling even *one* apiary of his own. The man who proposes to keep two or three out-apiaries, even after he has had experience, will find enough on his hands to occupy all his brains and energies, even in winter time.

ANSWERS TO QUESTIONS
FROM OUR A B C CLASS.

This department is designed primarily to cover questions either not already answered in the A B C of Bee Culture(price in cloth $1.25), or, if incorporated in this work, are here dwelt upon more in detail on account of the importance of the question. While these answers are of vital interest to the A B C scholars, they will doubtless be found, in many instances, to be of considerable value to the more advanced student. For lack of space, the question itself, instead of being directly stated, is omitted, the same being implied in the answer. It is hoped that the class will first consult their text-book before sending in their questions.

MISTAKEN IN STORES.

J. W.—The boy was probably mistaken as to the amount of stores the bees had. They should have had twenty pounds by weight. It is well for beginners to weigh the combs. If the aggregate will make twenty pounds, all right. If not, feed until they have enough.

SHUTTING BEES IN CHAFF HIVES DURING WINTER.

C. P.—Do not shut bees up, packed in chaff, outdoors. Give them a full entrance, and let them fly when they will. You may kill them if you keep them shut up. Bees that die in the snow, probably are of not much use to the colony. They are diseased, and hence fly out.

ARTIFICIAL FORAGE.

J. H. I.—It will not pay you, if you are a beginner, to plant for bee-forage. But very little is gathered, usually, from artificial forage. Natural sources are usually depended upon. Alsike clover, buckwheat, and rape, are usually safe to sow. See "Artificial Pasturage," in the A B C book; also "Alsike," "Buckwheat."

MARKET VALUE OF DARK HONEY.

Miss H.—Dark-colored honey never sells for as much as light-colored. As a general thing it will not bring much more than half; 25 cents at retail certainly would be very high for dark honey, especially if the flavor were of an inferior quality also. The best way to dispose of candied comb honey is to feed it to the bees.

ABOUT WHEN A SWARM MAY BE XPECTED.

H. G.—You can not tell exactly when bees will swarm; but from conditions in the hive, you can say they will swarm in a day or so *perhaps*. The conditions are, an overcrowded hive, large amount of brood, several queen-cells which will hatch in 24 or 48 hours, and a good honey-flow. See "Swarming" in the A B C book.

PROXIMITY TO THE HIGHWAY, FOR BEES.

C. W. Y.—The outskirts of the apiary should not be closer than 100 feet to the highway, and on account of the children it would be better to have it that distance from the house. With a high board fence, or a hedge six to eight feet high, the apiary may reach clear up to the highway, and very little trouble, if any, will be experienced by passers-by.

SENSE OF HEARING NECESSARY OR NOT FOR A BEE-KEEPER.

A. T. G.—Impaired hearing would have very little to do with your failure or success as a bee-keeper. The only difference, and that would be slight, would be that you would sometimes be unaware of the issue of a swarm, from your inability to hear the swarming-note; but by keeping on the watch during swarming time, as every bee-keeper should, you would lose few swarms. Again, you might miss some of the pleasures of a bee-convention. One of the best bee-keepers in the State of Ohio is hard of hearing.

TOBACCO COLUMN.

CONDITIONS UNDER WHICH WE GIVE SMOKERS TO PERSONS WHO STOP USING TOBACCO.

First, the candidate must be one of those who have given up tobacco in consequence of what he has seen and read in this department. Second, he promises to pay for the smoker should he ever resume the use of tobacco in any form, after receiving the smoker. Third, he must be a subscriber to GLEANINGS. Any subscriber may, however, have smokers sent to neighbors or personal acquaintances whom he has labored with on the matter of tobacco-using, providing he give us his pledge that, if the one who receives the smoker ever uses tobacco again, he (the subscriber) will pay for the smoker. The one who receives the smoker in this case need not be a subscriber to GLEANINGS, though we greatly prefer that he be one, because we think he would be strengthened by reading the testimonials from time to time in regard to this matter. The full name and address of every one who makes the promise must be furnished for publication.

A MINISTER WHO USES TOBACCO.

I enjoy Our Homes very much. It is all written in such a practical way, just like the experience of so many others, that it is of great help to resist temptations. I have had a temptation all my life—that of smoking. Although, through the careful training of parents, I never used tobacco in any form, yet there is still a desire for it. Now, while I believe we should have a great deal of charity for the failings of others, when a servant of God who sets himself up to teach others the truth and *purity* of the word, one can hardly tolerate the use of tobacco. A minister of this class called at our house, and during the time he was offering up prayer and thanksgiving to God, he was compelled to stop three times to expectorate the vile quid. Now, this seems pretty hard; but still it has its influence on others by disgusting them. But, friend Root, what ought one to say to such a person? God hasten the day when tobacco will become extinct.

Linn, Kansas. J. T. VAN PETTEN.

Friend V., I can not tell you exactly what you ought to say to a minister who persists in the use of tobacco; but I would say, in general terms, try to say that which will do the most good and not do him harm. Pray for him, and pray for yourself before you say any thing, and ask the Holy Spirit to help you to act and speak wisely. With such a preparation before you, you will be very unlikely to do harm. But even if he does not stop forthwith, give him to understand that you consider him a brother still. And let us remember that it is everybody's privilege to do as he sees fit or thinks proper, in all these matters where there are differences of opinion. In returning from a convention in Michigan I rode several hours in the night with a good brother who is a professor of religion, but who acknowledged to me that he used tobacco, and either could not or had not given it up. His son in the seat with him listened to all our talk. I told him I should pray for him, and told him that it would be good news to me at any time to hear that he had, with God's help, broken away from the bondage. In a few months the son wrote to me that his father broke right square off shortly after our talk. I am now waiting anxiously to hear that the son has come out before men and confessed Christ Jesus. May be when he reads this he will gain courage.

THE FUN IN QUITTING TOBACCO.

I have used tobacco 20 years. I have quit using it. I have not used any for over three years. I now propose to handle bees for 20 years, and see which is the most profitable for me to handle—bees or tobacco. If you have never used tobacco you don't know the fun there is in quitting it.

Athens, Pa. JULIUS WHITE.

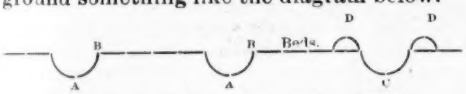
SPECIAL DEPARTMENT FOR A. I. ROOT, AND HIS FRIENDS WHO LOVE TO RAISE CROPS.

That art on which a thousand millions of men are dependent for their sustenance, and two hundred millions of men expend their daily toil, must be the most important of all—the parent and precursor of all other arts. In every country, then, and at every period, the investigation of the principles on which the rational practice of this art is founded ought to have commanded the principal attention of the greatest minds.

JAMES F. W. JOHNSTON.

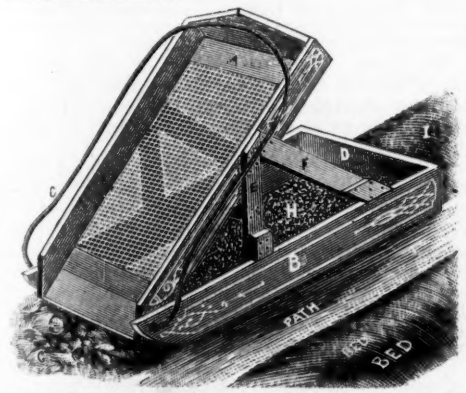
HOW TO MAKE PLANT-BEDS ON THE WORST KIND OF GROUND.

In our last issue I promised to tell you how to make plant-beds on the worst kind of ground. Keep on just as I have directed before. Now, no matter how much underdraining you have done, you want overdrains, or surface-drains. J. M. Smith had them in his beautiful sandy soil at Green Bay, and I am sure we want them everywhere. For the plant business I would have these surface-drains 3½ feet apart, from center to center. These surface-drains also form paths to walk in as well as to carry off the surplus water. We make them with two horses by means of Darnell's furrower and marker. Our machine leaves the ground something like the diagram below.



HOW TO MAKE YOUR PLANT-BEDS.

A A are paths, and B B the beds. The machine leaves the ground as we have shown it on each side of C. D D shows the fine soil scooped out of the bottom C. This fine soil is leveled down and brought into shape by a machine of my own invention, illustrated below.



MACHINE FOR MAKING BEDS FOR VEGETABLE-PLANTS, FLOWERS, ETC.

The runners of this sled arrangement are to go in the paths A, A, in the diagram above. The sieve or screen is just the kind they use for screening sand, gravel, etc. It is set at such an incline that, when the soil of the bed is thrown on top of the screen, the fine dirt and fine manure will go down through, while the rough part slides down to the ground at G. Here we have small stones, clumps of dirt, chunks of manure, weeds, sticks, trash, etc. The meshes of this screen are ¼ inch; that is, there is a ¼-inch space between the wires. The operator scoops out the soil of the bed, and throws two or three shovelfuls on the screen A. Then with his foot and shovel he levels off the coarse part at G, takes hold of the bail C, and pulls it along, say a foot, then shovels some more dirt, and pulls it along, and so on. The result is, that the surface of the bed is soft fine soil down several inches, and it is finer and smoother than any soil you ever got by raking. If your ground is in very good order, you may have four or five inches of this beautifully fined-up soil, most thoroughly mixed and mingled with all the manure that has been put into it, and the big lumps and trash are all down beneath. The back end-board, D, as the machine is drawn along, smooths the surface so it should be almost or quite ready for the plants. Our engraver has left the surface of the beds rounding, where they should have been flat. The *paths*, or surface-drains, are rounding, or hollow, while the beds are perfectly flat, as shown in the diagram. This apparatus not only does the work very much faster than it can be done with the garden-rake, but it leaves the soil in a much better condition for the plants. I have been astonished at the enormous productiveness of these plant-beds when the weather has been favorable. A man, or even a boy who has had a little practice, will go over the ground very rapidly. When the paths get weedy, get your marker and draw over it with a team, and they will be scraped out most beautifully.

For planting cabbage, celery, and every thing of this description, we take a roll of poultry-netting, the exact width of the top of the bed. This netting is ordinarily of 2-inch mesh. For the celery, we have used 1½-inch mesh. Unroll it, and then roll it up the other way, so that, when laid on the ground, it will lie flat. Make it stay by means of some bricks laid on it, wherever it bulges up. Now give the boys an ordinary cheap wooden sled that will just span the beds. When one of the boys is working, he can sit on the sled and put the plants between his feet. We ordinarily, however, have two boys work together. As the plants are put in, their sled, or seat, is pulled along. If the weather is hot and dry, a barrel of water and watering-can should be right beside them. While I write, at least a dozen schoolboys are busy putting out celery and cabbage (a plant in each opening), for we had a nice shower last night.

Now, before you say it is too much fuss and trouble, and will not pay, just remember what I told you before; and I feel sure that it will prove true in almost any locality. When you get your piece of ground up to its highest notch of fertility, the prod-

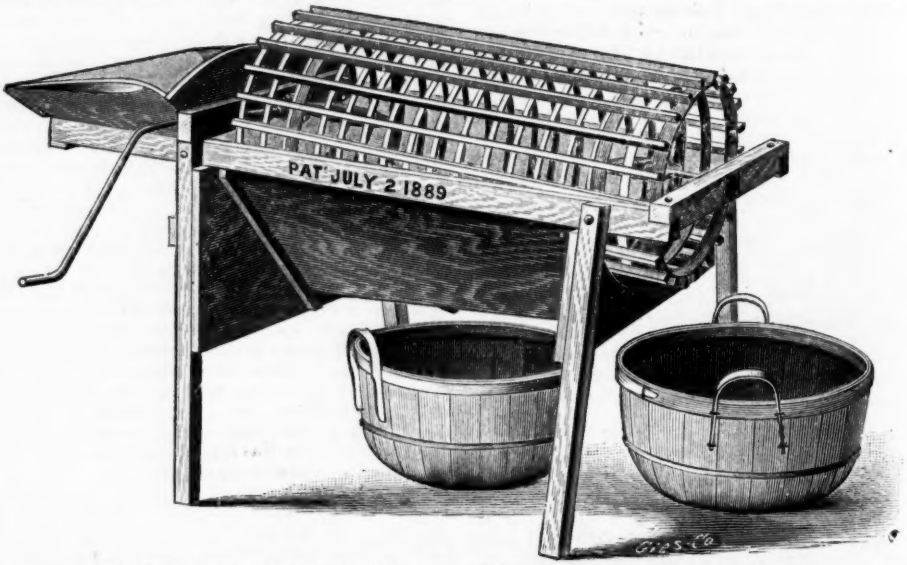
uct of a square yard of your beds in *four* or *six weeks'* time *may* bring you a dollar bill. But even if it brings you only 25 cts., just figure up what a quarter of an acre will amount to. This ground, worked on the high-pressure principle, using guano and liquid fertilizers, should be bearing crops of some kind from the first of April to the first of October; and with the aid of glass to keep off the frost, it can be growing a crop every month in the year. You may take exception to some of these statements; but if you do, I shall tell you that you *never saw* a square yard of ground doing what it is *capable* of doing; in other words, you have no comprehension of *God's gifts* to the diligent *lover* and *searcher* in this direction.

A MACHINE FOR SORTING POTATOES.

For two or three years past, we have been sorting our potatoes with a sieve covered with poultry-netting of the right size of mesh. The way we used this sieve was to place four bushel boxes tight up together. The sieve was laid on top of these boxes, and about a bushel of potatoes poured in. Then a boy at each side would shake them until the small ones had passed through. The large ones were then poured into two more potato-boxes, placed side by side. This was a good deal faster than sorting them by hand, and there was not any guesswork about it. All that went through the meshes were sold at a low price. I soon made up my mind that a machine was needed to do it faster and with less labor. But the more I thought of it, the better I became satisfied that some competent person should take the matter in hand, and, by means of a series of experiments, work out just what was needed. I then had in mind a sieve suspended so as to oscillate, letting the potatoes roll off the lower end. With a view of finding out whether any such machine had been made, I made inquiry through the *Rural New-Yorker*. That inquiry brings to light the machine we illustrate below.

You see, these friends have gone ahead of me in making it in the form of a revolving cylinder. Here is what they say about it:

You will notice at once that it's "just the thing;" "wonder some one hasn't thought of it before." Well, here it is now, and at a price within the reach of all. With this machine, which weighs less than 100 lbs., two men and a boy can sort and put into the wagon from 80 to 100 bushels an hour. It can be operated by one person, if necessary. As you see, the potatoes pass from the hopper into the cylinder, which should be turned very slowly, by a lazy boy; and if he has got the "spring fever," so much the better. Have him pick out the decayed or scabby potatoes as they pass through the hopper, otherwise he will want to go to sleep. If the potatoes need sprouting, raise the lower end of the machine, or turn the cylinder half way over and then back, or both. The small potatoes, dirt, straw, etc., will fall under the sorter into the basket, while the merchantable ones will be delivered into baskets as shown, or they may be run on an incline into the cellar. To sort seed potatoes from the small ones, just wind the cylinder with binder twine the proper mesh, and the result will surprise you.



THE HOOVER POTATO-SORTER, MADE BY HOOVER & PROUT, AVERY, ERIE CO., O.

We have been using one of the above machines for two or three months past. I had not thought of having a sprouting-machine to take the sprouts off; but this machine actually does it pretty fairly. To keep the potatoes from flying around the room we have tacked on a couple of sideboards, reaching up about as high as the top of the reel; but we greatly prefer to have the bushel boxes instead of the baskets, as shown in the cut. The boxes can be placed under the machine, pushed up so tight together that no potatoes, dirt, or rubbish of any kind, can get out on the floor. The price of the machine is $15.00.

SOME HINTS ON RAISING ASPARAGUS.

Friend Root:—As you are very fond of gardening I thought I would write you a treatise on asparagus, as it is but little cultivated, and one of the best of vegetables, coming in early when there is but

little else in the vegetable line to be had. The seed can be obtained from the leading seedsmen, and planted in a great part of the U. S. in May. In the fall and early winter, the seeds, when mature, can be gathered, and they are easily cleaned by putting them into a vessel of water and rubbing them with the hands, when the seeds will settle to the bottom, and the hulls, etc., will come to the top, and can be dipped or drained off, leaving the seed nice and clean. Plant the seeds in April or May, according to climate, in rich mellow earth, about an inch deep, with the seeds two or three inches apart in the drill. Keep them well cultivated for one or two years (two years give the best roots), when they are to be reset in very rich land (unusually well enriched), some time before resetting; the roots are to be put out in trenches somewhat below the general level, and a slight ridge, or bed, is to be made over the roots, and these beds, or ridges, must be kept free from weeds and grass. The plants ought not to be cut or used the first year, or the same year that they are reset. Fertilize annually, and the planting will last for a lifetime, or a good many of them, doubtless. They ought to be reset in the trenches or rows at least one yard apart. A tablespoonful of seed will raise plants enough for a good-sized family. It is a salt-water plant by nature, hence light applications of salt promote the growth of the plants, and also help to keep down weeds and grass. R. JONES.

Design, Va., April 28, 1890.

Thank you, friend J. Our experience is rather limited in raising asparagus, but we have found this true: There has never been a surplus yet in our market. Last season we cut continuously from the first of May till the first of July, and some even later; but the plants seemed just as thrifty this year as ever. Two years ago we ran our little seed-drill twice the length of the field, but sowed seed pretty thickly, for the plants in some places were less than an inch apart. Since then we have done nothing but run a cultivator each side of the row, and hoed them out two or three times; and this spring, from those two rows, we have sold certainly $25.00 worth of roots. It is almost the only vegetable with which we have never yet succeeded in overstocking the market.

OUR HOMES.

But the water that I shall give him shall be a well of water springing up into everlasting life.—JOHN 4: 14.

MOST of you know how much I love to see springs of water. Hunting for springs has been one of the hobbies of my busy life, especially if the springs are perpetual, bubbling forth their treasures winter and summer, year in and year out. Where water is plentiful, we think little of its value. I was greatly pleased in California, and along the desert wastes, to see how much value was set upon a living spring. Even if the water that is poured forth is but small in quantity, if the little stream keeps running winter and summer, in the course of time it amounts to a great deal; and there is something pleasant and fascinating to almost every one in seeing the water spring forth, and keep running unceasingly. My friends laugh at me because I go up on the hill so often to see the windmill raise its treasures of water. When I am tired of reading your letters, I look out of the window just as I am looking out of it now while I dictate this, and see the beautiful piece of machinery raise its burden of pure water from the depths below. Although it has pumped more than 500 barrels a day, there has never been any indication of the well giving out, and the water has already acquired the reputation of being the best drinking-water in the town.

For a week back, our wood-working factory has been humming and buzzing through the night time as well as through the day. As we started up suddenly, to try to fill your orders by working both day and night, we were obliged for a time to use coal-oil lamps to light the workmen. The question was asked whether I dared to take the risk of getting our whole establishment burned up, as was that of friend Lewis. I replied that I had very little fear while the sprinklers covered every foot of space right over the work, and so long as the windmill kept the great tank full of water; for such an abundant supply of water, springing forth at the first start of the fire, must necessarily drown it out before it could make any headway. Am I getting away from my text? I hope not, dear friends, for I have been thinking that this perpetual spring of water is to our business like the follower of Christ in any community where there is danger of the fires of sin drowning out all that is good. The woman told Jesus that the well was deep. She seemed to think the waters of that well that had quenched the thirst of Jacob and his children, and their generations all along down, was one of the great essentials in their time, and so it was. But the Savior next told her of the living water; and he said it should be in the heart of the possessor like these *living springs*, and that it should refresh and invigorate all around by its unceasing supplies that should give everlasting life. Dear friends, these words are more true than perhaps you and I shall ever know. As we go on and persevere in the Christian life, we shall know more and more of the value of these waters, and their power to refresh, awaken hope, gladden, and give joy, until that everlasting life beyond shall be the end.

We are greatly inclined to forget this promise. This fountain will be neglected and choked with worldliness if we do not look out. Then, perhaps, we shall look back to the time of our conversion, and lament that the pure waters are not *now* springing forth as they did then. But it need not be so, dear brother and sister. It may be, and should be, as in the text, a well of water springing forth and giving hope and joy and everlasting life to all around.

Through all my religious experience I have been in the habit of expecting, day by day, *fresh* experiences welling forth from my heart—something new, joyous, and refreshing, coming, as it were, of *itself*—burst-

ing forth without any agency of my own, and giving me something fresh, bright, and new to give to my friends all around, to cheer and encourage them, and to revive and refresh their hopes and their faith. This thing of which I have been speaking has been one of the joys of my life, and I have been led to expect it. But let me tell you that this fountain is easily dimmed and choked up, if I do not constantly beware of the tempter. The experience I spoke of a few months ago, where Satan for a time bid fair to get a foothold, for a time checked or kept back these experiences. I knew it would be so; and when he was trying to make a barter for something he had to offer, over and against everlasting life, one of the things that kept me back was, that I knew I should soon lose these bright experiences of that living water, coming forth, oftentimes, when I least expected it. "Ye can not serve both God and mammon." If I listened to *him*, I knew I should have to abandon all at once. And yet I did not get away from him easily. He followed me days and nights. He tried first one thing and then another; and even after he seemed to have *abandoned* his undertaking, he would come back now and then. I hardly need tell you that the one who expects to do spiritual work—who expects to be successful in bringing souls to Christ, must be wholly in the service of the Master. There can be no half way about it.

For some time I had been feeling that my gift, if that is the right name for it, in presenting the cause of Christ to my friends and acquaintances, was being drawn gradually from me; but when I turned resolutely about, and prayed earnestly, alone by myself, it has come back again; and within a few days these experiences that I have been telling you of have been coming thick and fast; the shackles and fetters have fallen away, and Satan has no power, and my spiritual vision is undimmed and unclouded, as in the time of my first turning to the Lord. Now, when we feel that this well of water that should *constantly* be in the heart of every Christian seems in danger of drying up, or ceasing to give its accustomed light-heartedness and bright faith, what should we do? And it is this thought that has prompted this paper to-day.

One who would have this living water springing up in his heart must first acknowledge God the creator of all things. A friend of mine who lives in California wrote some time since something like this: Said he, "If I were a praying man I would thank God every day of my life for this beautiful climate, for my growing crops, and pleasant surroundings, etc." I wrote back to him not to wait till he was a praying man, but to commence thanking God right away, and to do it out loud. I tell you, my friends, it is a grand thing, many times, to speak out plain and clear; and it is a grand thing to acknowledge your Creator and the great Judge of all the earth, right out loud. I told this friend, the next time he went out over those wonderful hills after his horses, in the bright morning, to begin speaking loud to the great God above, and to give him thanks and praise. Dear readers, if there are any of you who feel like this one of whom I have just spoken, try the experiment. When off alone by yourself, give praise to God. It will help you in a great many ways. First, you are acknowledging and paying respect and deference to the great Ruler over all; second, you are geting a start in being thankful to somebody. A human being who has no thanks to give to anybody —not even to God the Father—is in a deplorable state of mind. When you get in a way of thanking God, you are very likely to begin to feel like thanking friends and your neighbors when you meet them; and a man who has thanks to give to each one, and who *feels* thankful, is a gainer in a great many ways. He will get more of every thing good by having thankfulness and thanksgiving in his heart. After you have for some time become accustomed to thank God in your fashion, and after your own way, you will be pretty sure to begin to think of texts of Scripture right along in this line. How full are the Psalms of David of such expressions! When David was a shepherd-boy, off in the fields with the sheep, alone by himself, oftentimes with only the stars above him for company, he learned to give thanks. While I dictate I open the Bible at random. The Psalms are pretty nearly in the middle of the book. The first thing that meets my eye is this:

O Lord, my God, in thee do I put my trust.

And after this comes a prayer:

Save me from them that persecute me, and deliver me.

On the same page I read:

O Lord, our Lord, how excellent is thy name in all the earth! who hast set thy glory above the heavens. . . . When I consider thy heavens, the work of thy fingers, the moon and stars, which thou hast ordained, what is man, that thou art mindful of him?

If you have never loved the Bible, when you commence giving thanks to God you will find in it something that harmonizes with your feelings. Perhaps you will remember the prayer that Jesus uttered—"Our Father who art in heaven." And then how naturally comes the next—"Hallowed be thy name!" Why, as you utter these words and feel this sentiment in your heart, you will stand more erect, you will have a broader view of the universe, mankind included, and you will feel more like being honest, good, and true.

When you have learned to love God, and to love these Bible texts that speak of him —when you have learned to pray, even after the humble fashion I have indicated—you will begin to feel Satan striving to draw you away from sacred and holy thoughts. This new joy of yours can not be a well of water springing up into everlasting life until you begin to put aside self. These feelings of gratitude that bring joy and gladness will be dried up, and will soon be quenched if you give way to the temptation to wrong or to defraud your fellow-man.

You may dishonor the Master in a very small matter of business deal; and when you do so, this avenue is choked. It is hard to realize how exceedingly careful we

should be. Let me illustrate by a little incident. I tell it because I wish to show you how to keep the fountain flowing, and not because I wish to praise my own acts.

A man brought us some bees this morning. He made the remark that he got acquainted with A. I. Root a good many years ago. When asked about it he said something as follows:

He said he once had some bees to sell, and he was going to bring them out to us. One of his neighbors remarked that A. I. Root always did exactly as he agrees. He replied:

"I know better. A. I. Root does *not* always do as he agrees."

"How so?" was the reply.

"Why," said he, "he agreed to give me $5.50 per colony for some Italian bees. On the strength of this I drew them out to him; and when he saw them he did not do exactly as he agreed, for he gave me *$6.00* instead of $5.50."

Now, I have forgotten all about the transaction. I can only remember that, at different times, I have enjoyed doing business in just that way; and a great many times I have been glad of a *chance* of doing it, because such things honor the Master, and I always feel happy afterward.

If your money-getting, and getting ahead of your neighbor, are dearer than your love to God, this living fountain must cease for ever; and by and by it becomes a daily task to keep out the weeds of selfishness, and to keep unobstructed the passageways for God's love to come into your heart. Jesus strikes the point where he says, "If any man will follow me, let him deny himself and take up his cross daily, and follow me." You can not have this constant enjoyment otherwise. Lately I have learned particularly to enjoy going to sleep at night with a conscience void of offense toward my fellow-men. I have had some experience in going to sleep with the guilty feeling that I was cherishing, or coveting, something that was not lawful for me to have. Then this spring of joy was choked; my spiritual life was clouded; and when awakened in the morning, my mind would begin to grope for some dreaded remembrance. And, oh what a feeling it is to be obliged to face the recollections of guilt and shame of the day before. Now, let us contrast the joyous feeling of being able to look over the record of the day before, and find it clean. For a few months my first conscious thoughts have been something like this:

"Let me see; is there any thing on my conscience this morning, to mar the new day? Did I cherish evil and iniquity in my heart?" As memory brings up one after another incident, are there any great black spots—any great loads or burdens of sin that I must shoulder to-day—any remorse and regret because I have turned from the Savior and listened to the tempter? Perhaps it takes only a few seconds to review the day before; but, oh what a glad feeling comes when I can say there is nothing to feel bad about! I often feel to say in my heart, "Thank God, thank God, there was nothing when I closed my eyes in sleep last night to make me feel guilty and wretched this morning. I fought the good fight, and by the help of Christ Jesus I came off triumphant." Now, when I do commence in this way I am sure to have those experiences I have told you of—thrills of joy and thanksgiving—thrills that come along in the line of some remembered text that I never thought of before.

This is Monday morning. Last Saturday night we all sat up rather late in planting our new dynamo, and making attachments to the electric lights, so they would be ready to illuminate the saw-room at one o'clock this morning. When the expert who was putting up the plant announced that all was ready, we stationed ourselves in the room, which was pitchy dark, while he turned the lever and sent a current through the wires. In an instant the room was in a blaze of beautiful soft light from the incandescent globes. I called some friends to come into the room and see it. While they were making some experiments with the wires, the current was suddenly cut off. In an instant we were in utter darkness. But very soon, with a flash, the lamps were all in a blaze again. Perhaps these bright spiritual visions are hardly as quick as the electric current, but to the one whose heart is in perfect accord with Bible teachings, and to the one who is earnestly and honestly striving to follow Christ Jesus, texts of Scripture frequently light up with a wonderful new meaning, almost as vividly as did these beautiful electric lights. They fairly shine in their beauty and grandeur, and keep shining for evermore unless we darken them by deliberate acts of sin. For experiences like these, who would be guilty of such folly as to cloud and extinguish the light of God's love by things that can only sink us down in guilt and remorse.

As an illustration of the way these texts suddenly stand out with startling distinctness, I mention one that came into my mind a few days ago. I had been studying the lesson about restoring the daughter of Jairus. The servants came to him, saying, "Thy daughter is dead; trouble not the Master." Jesus, however, spake to him, saying, "Fear not; *believe only*." The two words, "believe only," came into my mind with sudden and startling distinctness. It is an exhortation to faith. Jesus told the father, that, even though his daughter was *dead*, he need not fear nor be troubled, providing he had *faith—believe only*. Have faith in Christ; trust the matter entirely to his hands, and nothing more is needed, and the promise comes down to us to-day—fear not, believe only. Another text has been much on my mind of late, and it is this: Most of us are constantly relapsing into a sort of infidelity, or want of faith. We can not believe, and steadily hold fast to the belief, that God has any great amount of care for us individually; or, in other words, we can not comprehend that the whole human family is dear to him. While this was in my mind, the thought came to me of what Jesus said, in speaking of the lilies of the field—"Ye are of more value than many sparrows;" and this I have been sayin

over to myself again and again: God cares for the sparrows; and he cares for the lilies, and he cares for all this great wide universe. But there is nothing in it all so dear to the heart of the great Creator as mankind—even sinful beings, such as we are. In fact, we are not to be compared with any thing else in the whole range of creation. "Ye are of more value than *many* sparrows." Now, if we hold fast to this one thought, God's love, his regard and his kindness, and his many promises, this thought itself shall give us this well of water springing up into everlasting life.

In closing this number of Our Homes it occurs to me that there are quite a few among our readers who feel like saying that I had better look to home and attend to my own affairs, instead of directing other people what to do, especially in this matter of unfinished orders. Never before, since the Home of the Honey-bees was started, have we been so much behind in filling orders. John says that, on Saturday night, we were over *eight hundred* behind. We are running night and day. We have pressed new hands into the service until there are people who are working for me whom I do not know by sight nor by name. For once in my life I have had the privilege of saying "yes" to almost every one who applied for work. Our gardening operations are sadly behind, and I had hoped to get a man or boy whom I could keep on the grounds. Just as soon as we get one taught the ways of our work, a message is sent from the factory for "More help!" That you who are suffering for the want of goods may have a little more charity, I will try to explain a little the difficulty of refusing to receive more orders or of returning the money. These 800 letters containing orders are scattered through our offices, packing-rooms, machine-shop, tin-shop, saw-room, wax-room, type-room, yes, and even into the greenhouses; and when somebody complains that his order is not filled, it takes a smart clerk sometimes an hour or two to find the order at all. If the goods are already gone, the book-keepers can generally answer; but even their work is so much behind that we have of late been sending a postal-card notice of shipment, by the first train after the goods were loaded on the cars; then the book-keepers can take a little more time to make out the invoice, and to adjust the balances, etc. It is a harder matter to get new hands to take hold of the book-keeping than almost any thing else. Again, every mail brings us more or less additions to orders, change in orders, countermand in orders; and a great many ask us to put their goods in with those ordered by some neighbor. This overhauling orders in process of being filled is very laborious, and seriously interrupts the workmen among the machinery. We try to fill orders in rotation, but even this can not be done. Machinery breaks down, hands get sick, and a variety of things occur to stop a certain order; while one for something a little different, even though it came a little later, can go as well as not. All these workmen numbering somewhere between 150 and 200, must be kept busy. While some orders are a month old, others, for a single lawn-mower, or even a honey-extractor or bee-hive, that happens to be ahead in stock, can go by next train; therefore it sometimes happens that a man may say with justice something like this: "You filled my neighbor's order within a week; yet mine has been with you for over a month." Others complain because we give them no notice of the delay, nor tell them what to depend on. Just now we hardly know what you *can* depend on; and to hunt up all the orders that are daily waiting for broken machinery to be repaired, or other similar accidents, would take more time than to fill the orders themselves. We stand ready to do *this*, however: To return your money promptly whenever you get tired of waiting. But with such a mass of business as we have now, every little while there is complaint that an order can not be *found*. One man asked to have his money returned or his goods sent; but it took some *three days of hard work* to find his order. When discovered we found it pinned fast to another man's order. He has asked to have his goods go along with those belonging to a neighbor; and to make sure they would go together, it was pinned fast to said neighbor's order. In the hunt, the two letters were supposed to be from the same man. The following letter shows the way in which my Christianity is frequently called in question:

Sir:—I sent you an order the 4th of April last, and received an answer that you had received it all right; since then I have not heard. Now, my Christian friend, is that the way you do business, or am I only an exception? It causes me a great deal of inconvenience, as Mr. Evans gave me an order which was put in with mine. He has bought 30 colonies, and is waiting for his smokers and wire, and nearly every day he comes and "dogs me" for his goods. He has finally concluded to write you and find out whether or not I have sent the order *at all*. Now, if you are so rushed as to make such unnecessary delay, I think you had better apply a little more genuine common sense, and real Christianity mixed, and employ a few honest and good men to attend to your customers' orders, for you know there is in every human being a desire to get what he has bought and paid for, within a reasonable time, say nothing about such delays as this. You undoubtedly remember a passage in the Bible that says, "Do unto others as you want them to do unto you." Now, when you order goods expecting them to be sent within a reasonable time, and you wait patiently over a month, and receive only a card, saying that the order and money had been received, and nothing further, I do not believe you would like to be treated in this way, would you? Now, if you have not sent the goods, please return the money, as we can not wait till next spring for the goods. N. C. EVANS.

Mt. Horeb, Wis., May 9.

Friend E., I agree with you exactly. I should *not* like to be treated in that way. I am happy to tell *you*, however, that your goods were sent May 6, three days before you wrote the above letter. Your suggestion in regard to hiring good and honest men strikes one of our great troubles. I believe that *honest* men are as plentiful here as anywhere; but *competent* men—men who can, without experience, go into such a whirl-

pool of business as ours, and help things along, are not very plentiful anywhere. The objection to having a great stock of things *ahead* is this: Only two years ago we had so many things in our warehouse that were not used nor wanted, that we had to cut our working force down to eight hours a day, right in the month of May. Worse still, a good deal of the work made up ahead was superseded by something better, and had to be sold at a loss, or thrown away. We did not anticipate this present *great* rush this season. We are, however, now planning a larger warehouse than ever before, with a railroad track on each side of it. One train of cars fills it with material, and the other unloads it as it goes to our customers; and another railroad is now in process of construction, which passes through our grounds, giving us an outlet *east and west* as well as north and south, as heretofore. The burning of friend Lewis' plant has had something to do with this present rush. Another thing, friend E., you sent your order in April—the very month when the great rush of the season usually begins. You know we have cautioned you in our price list about waiting until the great hurry of the season came, before giving us your order. Your goods were not shipped for a month and two days after you ordered them; and if you will tell me what will make the matter satisfactory, I will try to adjust it in a Christianlike way; and I wish to say to all the other friends, tell me in a Christianlike way how much you have suffered by our apparent bad management, and I will try in a Christianlike way to make the matter satisfactory. But please do not do it until we get a little out of our present fearful crowd and jam. I do feel greatly and deeply thankful for your kind confidence and encouragement, of years past; and even though many of you *have been* badly used for a short time back, I venture to subscribe myself, notwithstanding,

Yours in brotherly love, A. I. ROOT.

EDITORIAL.

The steps of a good man are ordered of the Lord.—Ps. 37:23.

EXHIBITS FOR THE WORLD'S FAIR.

DR. MASON sent us the following, which he desires us to add to his article on page 371. As the latter has been made up, ready for the press, we will add the same here:

I wish that all who are thinking of making an exhibit would let me know soon about how much space they will probably need; that is, about how many square feet of floor space. An average of over 230 feet each was occupied by the six principal exhibitors at the Ohio Centennial in 1888, where our friend A. I. Root's exhibit was crowded, although he was assigned a space of about 400 square feet, and some exhibitors with less than 70 feet made nice exhibits, and secured their share of premiums. Should the six or seven States nearest to Chicago make creditable exhibits, to say nothing of other States, there will be a grand display; but it is to be hoped that California, with her usual energy and vim, will not be one whit behind other States, and that Maine and sunny Florida, and that monster State, Texas, and all between, will do their share toward showing to the world a goodly sample of the sweetness within our borders; and we expect to be nobly backed by our Canadian friends, and we ought not to let them outdo us. I am corresponding with some of our leading exhibitors, to get their views for the benefit of all; and I have already written to some parties in the Old World, in the interest of the honey display; and when I speak of the honey display, I mean every thing connected with our industry. A. B. MASON.

Auburndale, O., May 9.

DOUBLE TOP-BARS, ETC.

ON page 380, mention is made of a top-bar having openings made with a wabble-saw. In my hand is a similar top-bar from E. M. Tennent, Willett, N. Y., only, instead of having slots made in it horizontally, there are eight ¼-inch holes bored. These holes will serve as a passageway for the bees, and, very likely, as a Hill device, or any thing of that sort. Ernest says that he has gathered from several letters, from those who have used double top-bars, that a narrower top-bar, if made double, will answer equally well in preventing burr-combs; that is, a top-bar ⅜ inch square will answer all right, providing it is slotted so as to make it equivalent to a double top-bar. If not slotted, it must be fully an inch wide to give us good results. Are there others who have used double top-bars, who have noticed this? The idea seems to be this: The opening forming a bee-passage produces something of the conditions of a slatted honey-board.

SELLING SECRETS FOR A SUM OF MONEY.

OUR older readers remember how often I have denounced this custom, and how often I have insisted that nothing valuable ever comes in this way—that is, nothing that can not also be found in books and periodicals. Of late, several good friends of mine have called my attention to the wonderful discovery of Dr. A. Wilford Hall, editor of the *Microcosm*. Dr. Hall, so it is said, has discovered a method of treating disease without the use of medicines; and so wonderful were the results that it was claimed that one could live to be 100 years old or more, by this drugless remedy. The price is $4.00, and the purchaser must sign a printed agreement not to divulge the secret of the treatment. I was quite willing to furnish the $4.00, but very reluctant to sign such a pledge. I did so, however, and I am glad to be able to say that the treatment is, in my opinion (at least in my own case), valuable. Notwithstanding my pledge, however, I feel that I can, with a perfectly clear conscience, say that the treatment is not new, neither is there any discovery about it. It is simply a revival of one of the lines of water-cure treatment, known, nobody knows how long ago, and the whole thing is well known to our physicians, and fully described in our medical books. In fact, I can, if our readers wish, copy the whole thing from Dr. Kellogg's book, entitled "Rational Medicine," page 663. And Dr. Hall himself gives a lot of quotations in regard to the value of his discovery; and these quotations are copied from "*Chicago Medical Society Trans.*" What has already appeared in print, of course any publisher is at liberty to copy, giving proper credit. Now, although good may result from reviving this branch of water-cure treatment (and I feel sure it will result), I think that Dr. Hall should be published as a swindler for taking money from those who are out of health, for something that is already well known. The most lamentable feature in the case is that Dr. Hall claims to be a Christian, and would persuade suffering humanity that God has revealed this wonderful drugless treatment to him, that he may take $4.00 apiece from his fellow-men, for a little pamphlet of only a few small pages. I am told that he has already received a good many thousand dollars in this way. I am sorry to say that many of the testimonials come from ministers of the gospel, and I do think these ministers ought to be ashamed of themselves.

CORKS FOR HONEY-BOTTLES.

WE extract the following from a private letter from Chas. F. Muth, on the subject as above:

All corks should be scalded with hot water before they are pressed into the necks of bottles. Put your corks into a bucket and pour hot water over them, when they will be as pliable as rubber. CHAS. F. MUTH & SON.

Cincinnati, O., March 14, 1890.

LOOK OUT FOR THE BOGUS DICTIONARY.

DOUBTLESS some of you have seen flaming advertisements of a complete "Unabridged Dictionary" for three or four dollars. When the notice first came out we ordered a sample; and, without orders, one of the books was sent to our office *C. O. D.* Now, it is an unheard-of thing to bring a package into the office of the Home of the Honey-bees with "C. O. D." on it. One of the boys brought it in, and, without noticing the C. O. D., the book was opened and examined. As soon as I looked inside of it, it went right straight back to the express office, and the publishers tried to make us keep it, "*because we undid the wrappings!*" The whole thing is a swindle from beginning to end. I would add, that it is a reprint of an edition issued in 1847—43 years ago, but I doubt whether any thing was known as poor and shabby even at that time. There is not a single illustration in it, except in the back part; and in the body of the work there is not a reference to any of the illustrations in the back part. How much good do the illustrations do you in that shape? After some jangling about it, we were required to pay the express charges back on the miserable thing.

ARTIFICIAL COMB HONEY AND MANUFACTURED SCIENCE.

THIS is the title of an exceedingly well-written article in the *Popular Science Monthly* for May, by Allen Pringle, President of the Ontario Bee-Keepers' Association. The writer locates the source of the falsehood regarding manufactured comb honey to Prof. Wiley's article, which appeared in the *Popular Science Monthly* for June, 1881, and alludes to the fact of its having been copied in the *American Encyclopedia*, and in the Supplement to the *Encyclopedia Britannica*, besides being copied through the press generally. It seems that the editor of the *Popular Science Monthly* was not aware until recently that the mischief took root in his magazine. Just as soon, however, as he was informed of the fact, he asked Mr. Allen Pringle—a bee-keeper and a scholar—to reply to it, and he has done it in a masterly manner. We should be glad to publish the article entire; but as our space is crowded, we can not; but we can not forbear quoting from the last paragraph, which reads as below:

I take the liberty of here suggesting to publishers of encyclopædias and scientific works, the wisdom of first submitting doubtful points and dubious assertions, made by men outside their special departments, to *practical* men in such departments, whether the latter be learned or unlearned, for the knowledge of an unlearned man touching his own particular line of business (even the science of it) may exceed that of the scientist both in accuracy and extent. Such a course would often save the specialist from humiliation, and spare the public the infliction of some very queer science, which, not infrequently, fails to dovetail with every-day facts.

There is one sentence in the above to which we wish to call attention; namely, that the knowledge of an unlearned man in his own line of business may exceed that of the scientist, both in accuracy and extent. Why is it that cyclopedias will sometimes, instead of going to practical men for information, employ some big-named scientist of little or no experimental or practical knowledge, to write up the facts? Allen Pringle is both learned and practical, and we hope, with Bro. Newman, that other periodicals will publish this masterly refutation as widely as they circulated the old Wiley fabrication.

FOUL BROOD.

BULLETIN 61, under date of April, 1890, of the Michigan Agricultural Experiment Station, treats on the subject as above, and it is signed by A. J. Cook. We have carefully looked it over, and consider it fully up to the times, and sound in its teachings. After treating of fungoid diseases in general, and dividing them into different groups as to form, such as micrococci, bacteria, spirillum, and bacillus (under which latter head comes foul brood), Prof. Cook goes on to describe foul brood in particular—its microscopic appearance, etc. His description of the symptoms of foul brood is good. Under "Remedies" he treats briefly of salicylic and carbolic acid. We are glad to see that he does not recommend them as a cure. Even our much-respected friend Chas. F. Muth does not recommend salicylic acid now, because he can not prevent reinfection. When we had foul brood, an old classmate of your humble servant, Ernest, while home on a vacation from Cornell University, was induced to make "pure cultures" of foul brood in test-tubes. In other words, he made a sort of beef gelatine, which, after being boiled, was stoppered in test-tubes with cotton batting. After heating the point of a needle, and letting it cool, he immersed it into diseased larvæ, and then plunged it into beef gelatine, which under the inoculation very soon became cloudy. These experiments were conducted with the greatest of care. "Now," said he, "if carbolic acid is a fungicide, it ought to arrest its progress." Into some of the inoculated cultures he introduced a small quantity of carbolic acid, and left it for a time. Instead of killing the bacilli as we expected, it had no effect upon it; for even after the addition of the acid other tubes could be inoculated. The phenol was administered in the proportions recommended by Frank Cheshire. That this was the real foul brood he had been treating, and not some other growth, was evidenced by examination with the microscope. If this experiment means any thing it means that carbolic acid has little if any effect as a fungicide. While it *apparently* kept down the disease in our apiary, I somewhat doubt whether it did any *real* good. I am glad to see that Prof. Cook recommends that sure and reliable method, transferring, as first announced by Mr. M. Quinby, and by him styled the "fasting" method, and, later, recommended by D. A. Jones. It never failed with us. Where hives are boiled for some minutes, the disease does not reappear. Some *seconds* is hardly safe, as the spores do not yield readily to a boiling temperature. Prof. Cook very much doubts whether the disease resides in the blood of the bees or queen, as suggested by Cheshire and argued by R. L. Raylor. We have repeatedly taken queens from diseased colonies, and dropped them into perfectly healthy ones, and no trouble followed. But that it does reside in the honey, and that it can be carried by robbers to all parts of the apiary, is beyond any question or doubt with us. Scores of instances have proved this. We are glad to recommend this bulletin to any who may have had foul brood, or have any doubt as to whether they have it or not.